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B.C. Hydro

LOW — PROBABLE — HIGH

PROJECTIONS OF GROSS LOAD REQUIREMENTS

ALL SERVICES
1983/84:2003/04

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A summary of these electric and gas projections was reviewed by B. C. Hydro's Corporate Management Committee on 4 July 1983 and subsequently submitted to and approved by B. C. Hydro's Board of Directors on 8 August 1983. The summary is included in this document in its entirety.

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FOREWORD

This document provides the supporting information for the "Summary of Projections of Electric and Gas Gross Load Requirements" which was approved by the B. C. Hydro Board in August 1983 and subsequently issued as a public document. That Summary is reproduced at the front of this report.

In addition to this document, six other reports have been prepared as part of the forecasting exercise and are an integral part of the projections of gross load requirements. These are:

(i) "Projected Energy Requirements to the Year 2002 - B. C. Forest Industry - 1983 Revision" by Woodbridge, Reed and Associates Ltd., April 1983.

(ii) "Forecast of Power Consumption by B. C. Mining and Smelting Industries" by H. N. Halvorson Consultants Ltd., March 1983.

(iii) "Forecast of Coal Mining Activity to 2002" by H. N. Halvorson Consultants Ltd., March 1983.

(iv) "Forecast of Activity in B. C. for Liquified Natural Gas, Extraction of Natural Gas Liquids, and Petrochemicals by Confer Consulting Ltd., July 1983.

(v) "The Commercial Sector in B. C., It's Growth and Space Requirements to 2002" by Currie, Coopers & Lybrand Ltd., April, 1983.

(vi) "Long Term Economic Outlook 1983-2002" by Corporate Economist, B. C. Hydro, June 1983.

The first five reports provide the rationale and principal basis for projecting the economic growth and load growth for the forestry, metal mining and smelting, coal mining, LNG and petrochemical and commercial sectors. The "Long Term Economic Outlook", which is based in part on the sector studies, provides forecasts of Gross Domestic Product (GDP), population, households and energy prices which are used to develop the load forecast.

Part One of this document provides a summary of the economic and population forecasts presented in the Long Term Economic Outlook and Part Two presents the forecasts of energy prices. Parts Three and Four present the forecasts of Residential and General Sales, based on the economic and demographic variables and energy prices in Parts One and Two and the results of end use studies, and Part Five presents the sales to large industrial customers based largely on the sectoral studies. Other B. C. Hydro sales and sales to West Kootenay Power and Light and Seattle City Light are presented in Part Six. Total B. C. Hydro sales are presented in Part Seven.

In order to use the electric load forecast for the purposes of system planning, the losses associated with these sales are estimated, and the requirements are expressed in terms of electric energy sent out and peak demand. This analysis, and the estimate of the proportion of B. C. Hydro's load served by the integrated system rather than the small proportion served by isolated diesel, is presented in Part Eight of this document.

Part Nine presents the basis for the band around the probable forecast reflecting its sensitivity to energy intensive loads. Low and high electric forecasts based on the low and high economic and demographic forecasts are presented in Part Ten. Part Eleven presents the detailed low, probable and high projections of natural gas sales on the Lower Mainland and a probable projection of L.P. gas sales on Vancouver Island. Part Twelve is a brief summary of the projection of Railway Operations.

Appendix A presents a discussion of how price effects have been incorporated in the forecast and reviews literature on this subject.

A brief outline of B. C. Hydro's electric load forecast methodology used in prepartion of this year's projections is included as part of this Foreword.

B. C. HYDRO

BRIEF OUTLINE OF THE ELECTRIC LOAD FORECAST METHODOLOGY

B. C. Hydro's load forecast is based on forecasts of population and economic variables and energy prices which are translated into electricity requirements using a "top down/end use" approach to forecasting. The top down aspect of the approach entails the use of the population forecast and forecasts of growth in the major industrial sectors and other components of GDP to project the rates of household formation, commercial activity and industrial production that generate the need for electricity. The end use aspects of the approach entails an examination of how various customers presently use electricity and how that use may change in the future.

The end use approach to forecasting differs from the econometric approach in that it does not involve the use of equations based on historic relationships between energy use, energy prices and other economic variables to estimate the effects of price changes on load growth. Rather the effects of prices are examined by first establishing the scope customers have for changing electricity use by measures such as installing more efficient appliances, switching to more efficient lighting, or self-generating electricity rather that purchasing. Having established the scope for changing electrical use, the responses of customers are estimated based on the energy price forecasts.

Although B. C. Hydro's approach to forecasting is not based on econometric analysis, it does draw on the findings of econometric studies. The results of the preliminary econometric analysis prepared by B. C. Hydro, ananlysis by others using B. C. data and the findings in the literature on the subject are taken into account in estimating customers' response to changing energy prices.

Residential Sales

The growth in residential sales is a function of the rate of household formation, the proportion of households utilizing electric heat, the levels of insulation in those households and the number of appliances installed and their requirements for electricity. The population forecast is translated into a forecast of household formation by type of housing by estimating headship rates and housing preferences for the various age groups.

The forecast of the proportion of dwellings expected to install electric heat is developed by examining the historic trends for capture rates of electric heat in the specific type of new housing, the relative heating costs prevailing at that time and a forecast of relative heating costs based on the energy price forecasts and the expected changes in efficiency for various types of heating.

The levels of insulation likely to be installed in electrically heated households and the electric requirements for new appliances that will be purchased over the forecast period are based first on studies of what is likely to select based on the energy price forecast.

General Sales

The General category comprises fairly diverse uses of electricity including sales to commercial, institutional and small industrial customers. For the purposes of forecasting, the load is divided into five principal categories:

(i) one category (representing 44% of total General Sales) for floorspace related loads such as retail trade and education which are forecast by first estimating floorspace requirements, based on forecasts of economic activity and population growth, and then estimating electricity use per unit of floorspace taking into account the projected changes in electricity prices;

(ii) a second category (28%) for loads such as other manufacturing, construction and utilities which are forecast by linking to growth in total GDP or the relevant components of GDP, as forecast by the Corporate Economist;

(iii) a third category (13%) for wood manufacturing which is forecast by linking to a specific industrial study;

(iv) a fourth category (7%) for loads such as common areas in apartments and religious organizations which are forecast based on the relevant portions of the forecast, i.e. apartment growth and population growth respectively; and

(v) a fifth unclassified category (8%) which is forecast to grow in proportion to the classified Commercial electricity sales growth.

In effect the first three categories entail the use of three separate methods of forecasting and the last two categories involve the application of certain aspects of these methods to remaining portions of the load.

Transmission Rate Sales

The principal Transmission Rate loads are the pulp and paper industry, the chemical industry serving the pulp and paper, metals mining and smelting, coal mining and other loads.

The forecast for the pulp and paper industry is based on the sector study for the forest industry as was the case for the wood manufacturing forecast. This sector study examines the annual allowable cut in the province, the relative advantages for the various pulping processes that would utilize the wood resource and the world markets for pulp and paper products to arrive at forecasts of production by product type. These production forecasts are translated first into total requirements for electric energy based on the requirements per ton for each type of pulp and paper process, and then into B. C. Hydro sales by projecting total requirements and subtracting estimated self-generation of electricity by the mills. The electric requirements for the chemical industry serving the pulp and paper industry is based on the forecast production rate for the chemical pulping processes.

The forecasts for metal mining and smelting and coal mining are prepared on a similar basis. The costs of the existing and potential mines in the province are analysed, the world market and prices for coal and various metals are examined and projections of production and electricity requirements are made on a mine-by-mine basis.

Other transmission rate loads include refineries, cement plants, bulk commodity terminals, pipeline loads and others. The forecasts for the various components of the category are based on the market for the products in British Columbia or externally where appropriate.

Although the above categories do include essentially all the existing and forecast bulk sales, the potential does of course exist for major new industries establishing in B. C. Where the likelihood of such industries is considered to be great, sector studies are carried out as required. To date a major sector study was prepared for the Liquified Natural Gas and Petrochemical industry. As other new industries become likely, additional studies would be implemented.

West Kootenay Power and Light and Seattle City Loads

Over the forecast period, B. C. Hydro will be serving a significant portion of West Kootenay Power and Light's load and making sales to Seattle City Light. The forecast for West Kootenay Power and Light is based on its own forecast which is reviewed and adjusted by B. C. Hydro. The Seattle City Light load is based on a proposed agreement with respect to the Skagit River and the level of sales is fixed over the forecast period.

Sensitivity of Probable Forecast

In addition to developing a single probable forecast based on the most likely economic, demographic and and energy price forecasts, a sensitivity range for the probable forecast is also prepared. This range is portrayed as a band around the probable electric forecast which reflects the uncertainty of translating the probable economic forecast into energy sales. It is still based on the probable economic, demographic and energy price forecasts but is estimated by changing the assumptions concerning the rate at which more efficient appliances are installed; the rate for use of electric heat; variations in household formation for given population forecasts; more or less rapid implementation of improved lighting systems in existing and new commercial buildings; a more or less electric intensive industry or the inclusion or exclusion of major industrial projects requiring substantial electric load such as LNG facilities.

Low and High Forecasts

The range of forecasts also includes a low and a high forecast representing a broader range than the sensitivity band around the probable and based on low and high economic forecasts developed as part of the economic forecasting exercise.

Short Term District and Customer Inputs

The foregoing discussion outlines the principal approach to preparing the long term total electric forecasts for the province. For both the Residential and General Sales forecasts, data are also gathered from the districts and the divisions on the short term outlook. This information is normally used to adjust the results based on the long term methodology in the first two or three years of the forecast, and forms the basis for making the district and divisional

forecasts. In the case of the Transmission Rate sales, information is also gathered from customers to determine their intentions on future use of electricity. The procedure is to first prepare the long forecast using the sector studies and then to adjust the first few years of the forecast, if warranted, to reflect the intentions of named customers.

July 1983

B. C. HYDRO
SUMMARY OF
PROJECTIONS OF ELECTRIC AND GAS GROSS LOAD REQUIREMENTS

This summary presents B. C. Hydro's long term projections of electricity and natural gas gross load requirements for the 11-year period to 1993/94 in detail, and for the remaining 10 years to 2003/04 in terms of total sales by category. A range of projections are presented for electricity and natural gas consistent with the low, probable and high economic outlooks prepared by B. C. Hydro's Corporate Economist.

Electric Service

The forecasts of electric requirements, presented graphically on the opposite page, comprise:

- a probable electric forecast based on the probable outlook for the economy;
- a band around that probable forecast reflecting the range of electric requirements that could occur with the probable economic outlook; and
- low and high forecasts based on the low and high outlooks for the economy.

The probable electric energy requirements are forecast to increase at an average annual growth rate of 3.9% per year from 31 513 GW.h in fiscal 1982/83 to 48 200 GW.h in 1993/94. Growth in electric energy requirements from 1993/94 is forecast to average 2.9% per year resulting in a 63 900 GW.h load at the end of the forecast period. All electric forecasts presented herein assume natural gas on Vancouver Island in 1986/87.

The tabulation below shows a direct comparison for the fiscal year 1993/94 between this probable load projection (July 1983) and the probable projections made in September 1981 and 1982.

	July 1983	September 1982	September 1981
Gross Electric Requirements 1993/94 (GW.h)	48 200	52 900	62 300
Slippage in 1993/94 Relative to Previous Forecast	2.5 yrs.	4 yrs.	
Average Annual Growth Rates 1982/83 to 1993/94 (%)	3.9	4.8	6.4

The reduction from the September 1982 Load Forecast to the July 1983 Forecast results primarily from:

- uncertainties with respect to the LNG project and related petrochemical facilities as a result of lower world oil prices; and
- slightly lower growth in sales to residential, commercial, small industrial and coal mining customers.

Gas Service

The probable natural gas requirements are forecast to increase at a somewhat lower rate than electricity, averaging 2.9% per year from 894.1×10^6 billing units (BU) in fiscal 1982/83 to $1\,219.2 \times 10^6$ BU in 1993/94. From 1993/94 to 2003/04 natural gas requirements are forecast to increase at an average rate of 2.7% per year resulting in sales of $1{,}592 \times 10^6$ BU at the end of the forecast period. This projection is lower than the one prepared last year as shown below:

	July 1983	September 1982
Total Sales 1993/94 (BU × 10^6)	1 219	1 308
Average Annual Growth Rates 1982/83 to 1993/94 (%)	2.9	3.5

The reduction in the natural gas forecast is caused mainly by a reduction in the interruptible and commercial components of the forecast which in turn are the result of:

- the increasing likelihood that major natural gas consuming projects will not be located in the Lower Mainland area as a result of strong public environmental concerns;
- the strong possibility that the two cement plants, which are the largest customers, will switch at least a substantial part of their load away from natural gas; and
- a forecast relative increase of natural gas prices with respect to oil (see Table E 4).

The major components of the probable electric and natural gas projections and the low and high projections are summarized in the balance of this document. The complete basis of the projections, the divisional breakdowns for the electric service and the projections of railway operations will be finalized in August in a document entitled "Projections of Gross Load Requirements - All Services".

In this summary, and in the forthcoming complete report, the emphasis is on the long term forecast so as to provide a basis for system planning. The first three years of the forecast will be updated in December 1983 for use, as required, in preparing a rate application and the 1984/85 operating budget.

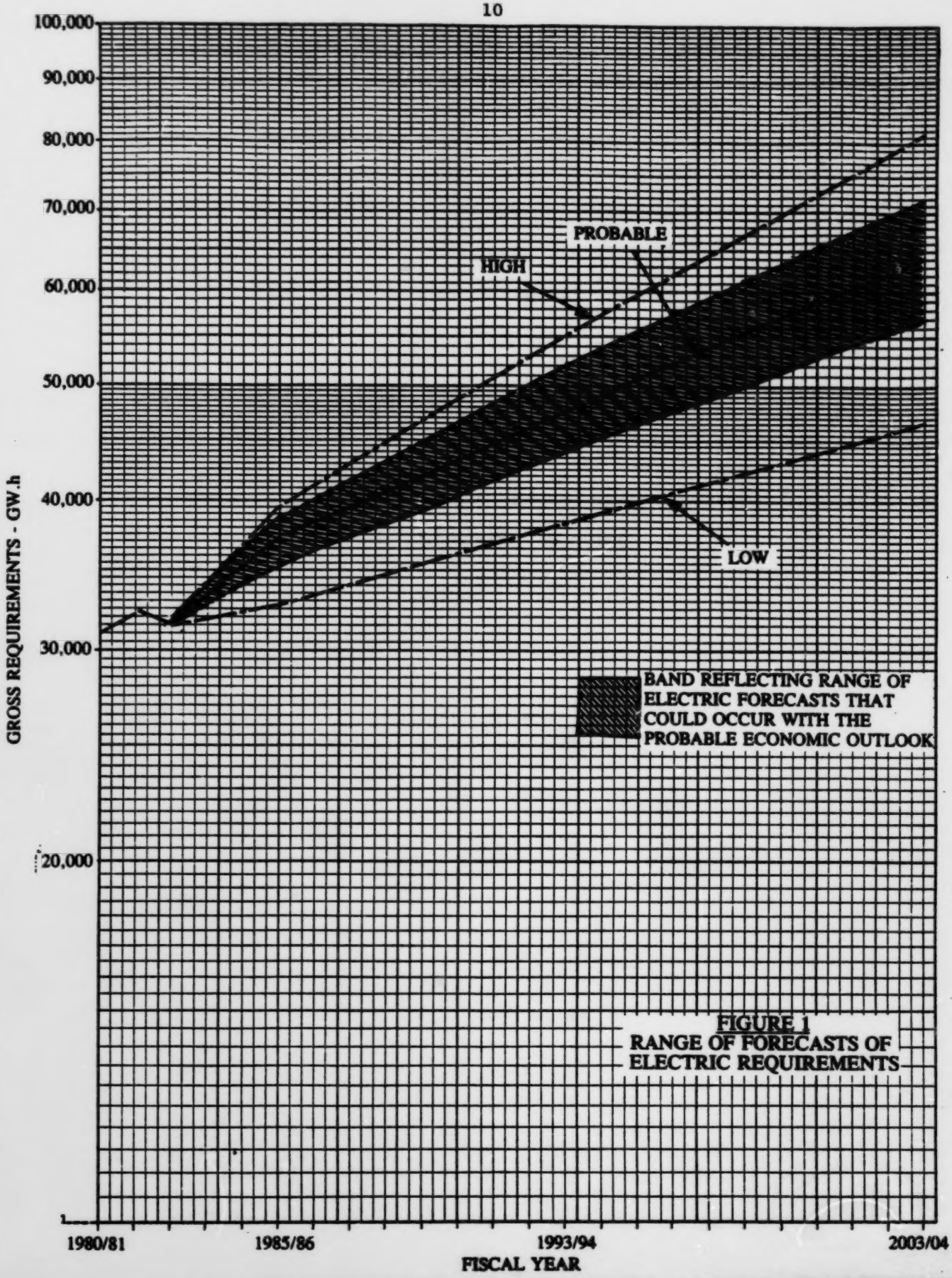

FIGURE 1
RANGE OF FORECASTS OF ELECTRIC REQUIREMENTS

ELECTRIC SERVICE

ELECTRIC SERVICE

Basis of Forecast

The probable forecast of electric requirements is based on the following outlook for population growth, the economy and energy prices:

- population growth averaging 2.0% per annum over the next 11 years;
- a slow but steady economic recovery starting in 1983 and accelerating in 1984 and 1985. The growth in Gross Domestic Product (GDP) from 1982 to 1993 is projected to average 4.0% per annum;
- electricity and gas prices increasing by 12% in real terms by 1988 and then remaining at that level;
- oil prices decreasing slightly in real terms between 1983 and 1986 and then gradually increasing in the 1990's (see Table E 4).

The projections of economic growth and certain components of the load forecast are based in part on independent studies of the likely growth in the major sectors of B. C.'s economy. These include a study of the forestry sector by Woodbridge, Reed and Associates Ltd.; studies of the coal mining and metals mining and smelting industries by H. R. Halvorson Consultants Ltd.; a study of the commercial sector by Currie, Coopers & Lybrand Ltd.; and a study of the LNG and petrochemical industry by Confer Consulting Ltd. Assistance in the coordination of these inputs and in the overall preparation of the load forecast was provided by Monenco Consultants Pacific Ltd.

The population, economic and energy price forecasts and sectoral studies are translated into electricity requirements using a "top down/end use" approach to forecasting. The top down aspect of the approach entails the use of the population and economic forecasts and sectoral studies to project the household formation, commercial activity and industrial production that generate the need for electricity. The end use aspect of the approach entails analysis of how various customers presently use electricity and how that use is likely to change in the future.

The end use approach to forecasting differs from the econometric approach in that it does not involve the use of equations based on historic relationships between energy use, energy prices and other economic variables to estimate the effects of price changes on load growth. Rather the effects of prices are examined by first establishing the scope customers have for changing electricity use by measures such as: installing more efficient appliances and higher levels of insulation, choosing an alternative source of energy for heating, switching to more efficient lighting, substituting other energy sources or modifying the way electricity is used in existing industrial processes, changing industrial processes, or self generating electricity rather than purchasing. Having established the scope for changing electrical use, the responses of customers are estimated based on the energy price forecasts.

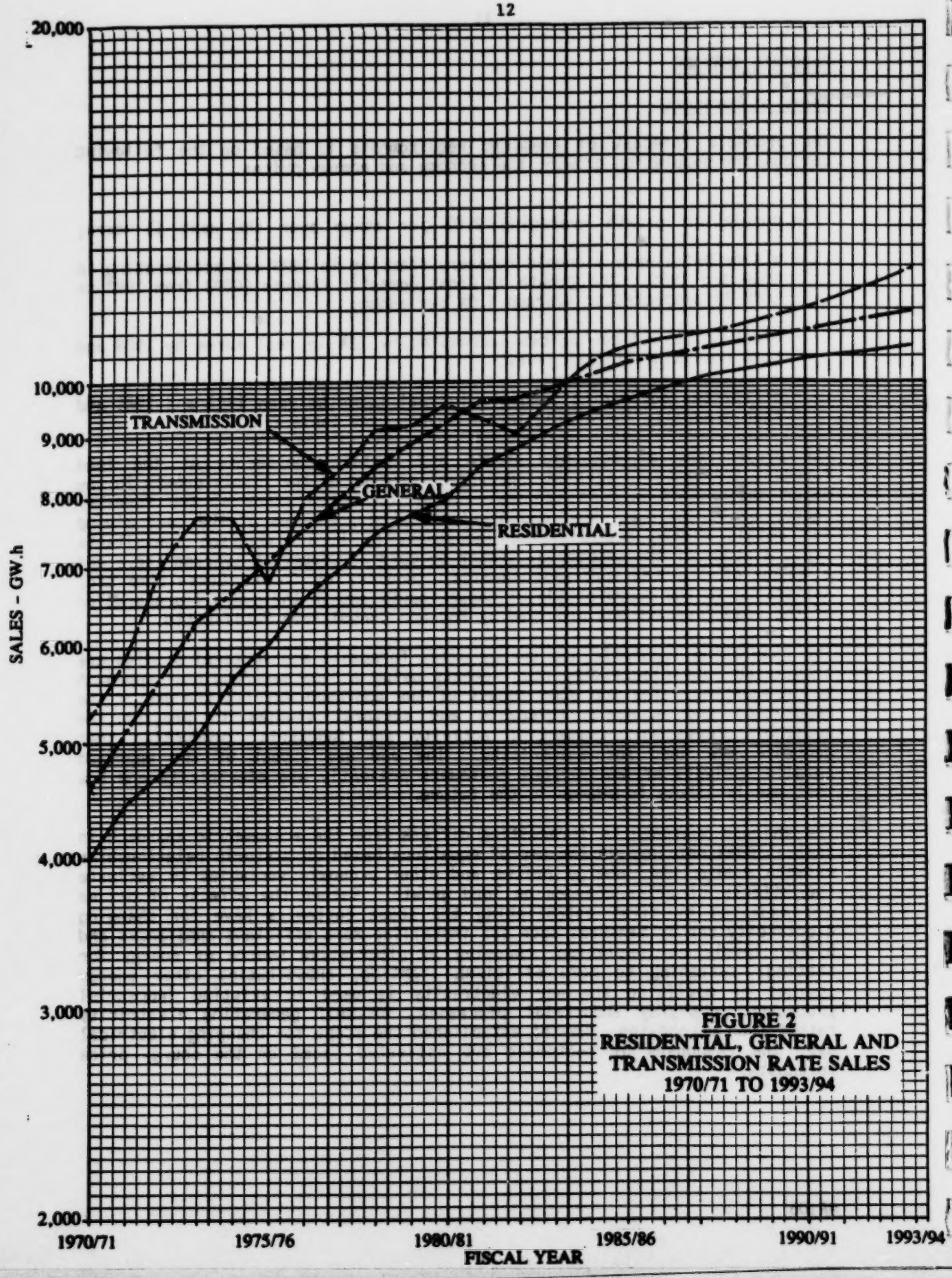

FIGURE 2
RESIDENTIAL, GENERAL AND TRANSMISSION RATE SALES 1970/71 TO 1993/94

Although the approach used to prepare the forecast is not based on an econometric analysis, it does draw on the findings of econometric studies. The results of the preliminary econometric analysis prepared by B. C. Hydro, analysis by others using B. C. data and the findings in the literature on this subject are taken into account in estimating customers' responses to changing energy prices.

Probable Forecast

The principal components of the July 1983 Probable Load Forecast up to 1993/94, and the historic growth rates experienced, are summarized below and presented graphically in the figure opposite.

	Actual 1982/83 Sales GW.h	Average Growth 1972/73 to 1982/83 (%/yr.)	1993/94 Sales GW.h	Average Growth 1982/83 to 1993/94 (%/yr.)
Residential	8 821	6.4	11 606	2.5
General	9 704	5.5	13 151	2.8
Transmission Rate	9 046	2.5*	14 995	4.7*
Other	620	3.2	836	2.8
Total Res., Gen., Trans. & Other	28 191	4.6	40 588	3.4
WKP&L	15		1 840	
Seattle City Light	-		318	
Total Billed Sales	28 206	4.6	42 746	3.9
Losses & Accruals	3 307	-	5 454	-
Total Gross Requirements	31 513	4.5	48 200	3.9

As was the case in 1982, Residential sales are forecast to grow at less than half their historic rate reflecting an essentially constant use per household over the forecast period. Although households will tend to have more appliances, and a larger percentage of households will use electric heat, these potential increases in use are offset by improved appliance efficiencies and higher levels of insulation as a result of higher electricity prices, and a trend towards apartments and row houses.

The General Category, of which about one-quarter is small industrial such as sawmills and three-quarters is commercial and institutional such as office buildings, stores and schools, is also forecast to grow at about half its historic rate. The lower growth rate is due to projections of achieving full utilization of the available wood resource which slows growth in the small industrial sector and, more significantly, projections of moderate growth in floorspace combined with lower unit electricity requirements in buildings in the commercial and institutional sector.

* As shown on the graph opposite, and discussed on Page 8, this apparent increase in the forecast growth rate is the result of the depressed sales in 1982/83.

Of the increase in total billed sales of some 14 500 GW.h between 1982/83 and 1993/94, approximately 6 000 GW.h are for the Transmission Rate Category resulting in a growth rate of 4.7% per year compared to a historic growth rate of 2.5% per year for this category. This apparent anomaly between declining growth rates in the Residential and General Categories but a higher growth rate in the Transmission Category is caused primarily by the depressed level of Transmission sales in 1982/83 as the result of the recession. If 1980/81 is used as a reference point, when sales were 9 597 GW.h, the historic growth rate over the previous 10 years was 6.2%/year and the 13 year growth rate to 1993/94 is projected to be 3.5% per annum.

The tabulation below presents the portion of the additional Transmission load that results from existing industrial capacity increasing its level of output and the portion needed to serve new industrial loads.

	Actual 1982/83 Sales GW.h	Increase in Sales from 1982/83 to 1993/94 resulting from: Higher Utilization by Existing Industry GW.h	New Industrial Capacity GW.h	1993/94 Sales GW.h	Ave. Annual Growth Rate 1982/83 to 1993/94 %/yr.
Pulp & Paper and Wood Mfg	4 721	1 624	1 600	7 945	4.8
Chemicals for Pulp & Paper	1 018	492	-	1 510	3.6
Metal Mining	2 340	350	610	3 300	3.2
Smelting	-	-	260	260	-
Coal Mining	294	481	65	840	10.0
Other	673	172	295	1 140	4.9
Total	9 046	3 119	2 830	14 995	4.7

The additional requirements of the pulp and paper and wood manufacturing sector account for over 50% of the total increase in bulk sales. The assessment of the resource base and market trends for this sector identified thermo-mechanical pulp (TMP) and chemi-thermo-mechanical pulp (CTMP) as the processes best suited to utilize and upgrade British Columbia's remaining wood resource base.

Whereas chemical pulp utilizes less than 50% of the wood fibre and requires both heat and mechanical energy, TMP and CTMP utilize over 90% of the wood fibre and require mostly mechanical energy for grinding. The absence of wood wastes to fuel self generation and the greater need for mechanical energy result in purchased electric energy requirements per tonne of TMP and CTMP being about five times those for chemical pulp.

Currently, six mills have installed mechanical pulp capacity. Of the 3 224 GW.h increase in sales to this sector, 1 624 GW.h are required to bring these mills, and other existing mills, to full production. The remaining 1 600 GW.h of the increase is to serve five new CTMP mills projected to be

operating by the end of 1993/94 and to meet the additional electric requirements resulting from the substitution of TMP for stone groundwood pulp in existing mills.

The low level of activity in the pulp and paper industry in 1982/83 substantially reduced the demands on the associated chemical industry. The sales of 1 018 GW.h in 1982/83 to the chemical industry compare with 1 427 GW.h in 1980/81 when the pulp and paper industry was operating at a more normal level. The forecast level for 1993/94 of 1 510 GW.h is for a modest increase over the 1980/81 level.

The forecast for metals mining sector is based on an analysis of major British Columbia mineral deposits at existing and potential sites combined with an assessment of market volume, price and foreign competition. The increase of 960 GW.h from 1982/83 to 1993/94 comprises 350 GW.h to bring existing capacity back to normal utilization, 170 GW.h for new capacity at existing copper mines, 400 GW.h for increased production at Bethlehem/Valley Copper and 40 GW.h for a new molybdenum mine. In 1993/94, 90% of the electricity consumption is for copper mines.

Of the 260 GW.h growth for smelting, 230 GW.h is to meet the load of a copper smelter projected to come on stream in 1992, and the remaining 30 GW.h is to meet Cominco's growing requirements. Cominco's requirements increase as a result of a ferrosilicon smelter projected to be built in the area. At the present time, smelting loads, which amount to some 6 500 GW.h in the province, are supplied by self generation.

The assessment of the international markets for B. C. coal indicates that there will probably be no major new coal mines during the forecast period and that existing mines are unlikely to operate at full capacity for sometime. Although this outlook is below the 1982 forecast, it still results in new load of 481 GW.h between 1982/83 and 1993/94 for existing facilities, including those presently under construction, and 65 GW.h to serve two new small mines near the coast.

The assessment of the Liquified Natural Gas (LNG) market indicates that forecasts of lower economic and electricity growth in Japan have reduced the need for LNG projects around the world, and lower world crude oil price forecasts have reduced the viability of the potential projects. While an LNG load of approximately 1 000 GW.h, which was included in the 1982 probable forecast, is not included in the current probable projection, an allowance is made for this, or a similar type of load, within the band shown in Figure 1. As a result of the declining prospects for the associated petrochemical industry, the ethylene and derivatives plant (430 GW.h in the 1982 forecast) is not included in this forecast and the load for a natural gas liquids (NGL) extraction plant is scaled down from the 300 GW.h in the 1982 forecast to 100 GW.h in this forecast.

"Other" Transmission requirements, comprising oil refineries, cement plants, grain elevators, coal and other bulk commodity terminals, compression loads, rail electrification, UBC, the NGL extraction facility and others, are forecast to increase by 467 GW.h over the period to 1993/94 reflecting growth across these sectors.

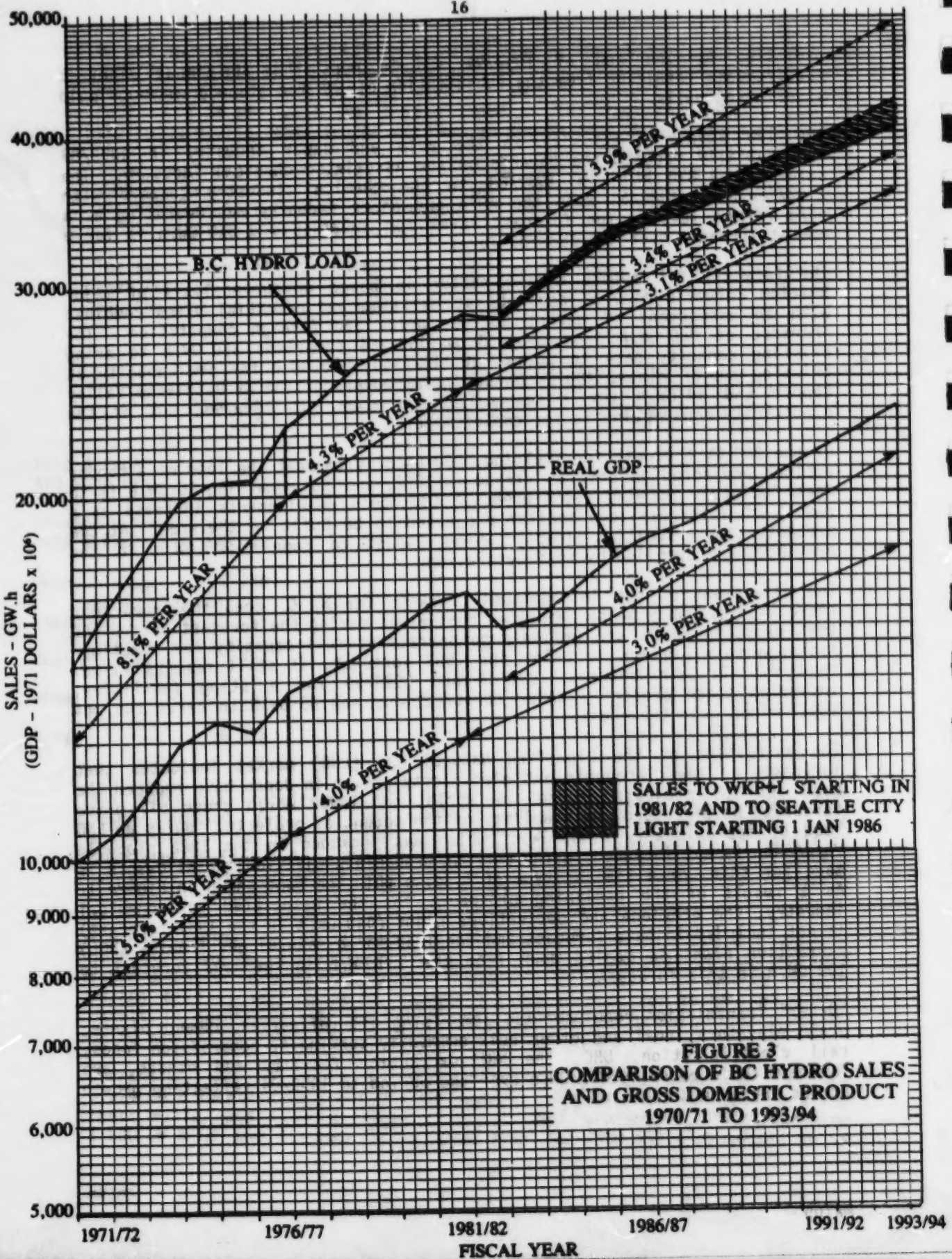

FIGURE 3
COMPARISON OF BC HYDRO SALES AND GROSS DOMESTIC PRODUCT 1970/71 TO 1993/94

In addition to the Residential, General and Transmission Rate categories B. C. Hydro provides service for street lighting, irrigation, firm exports, inter-utility and own use. These Other sales are forecast to increase at an average annual rate of 2.8% per annum from 620 GW.h in 1982/83 to 836 GW.h in 1993/94. The total sales to B. C. Hydro's four categories are forecast to grow at 3.4%/year compared to a historic growth rate of 4.6% per year.

Over the forecast period B. C. Hydro's sales to West Kootenay Power and Light (WKP&L) are forecast to increase from 15 GW.h in 1982/83 to 1 840 in 1993/94 and sales to Seattle City Light of 318 GW.h will commence in 1986. Up to 1981/82 WKP&L had met its load from its own generating capacity and purchases from Cominco. Over the forecast period B. C. Hydro will be supplying WKP&L's new loads and some of its existing load as Cominco utilizes more of its own generating facilities. The Seattle City Light load results from the proposed agreement not to raise the Ross dam to avoid flooding the Skagit Valley.

As shown on the graph on the opposite page these new loads increase the projected rate of load growth for the 1982/83 to 1993/94 period from 3.4%/annum to 3.9%/annum.

Sensitivity to Probable Forecast to Energy Intensive Load

The relationship between the growth in the economy and the resulting growth in consumption of electricity has changed significantly since the early 1970's. Whereas in the 1970's electricity sales were growing about 50% faster than growth in GDP, in recent years the two growth rates have been similar, as indicated in the graph on the opposite page. To arrive at a range of forecasts which are consistent with the probable economic forecast, the uncertainties associated with translating economic/demographic/price forecasts into electric forecasts are examined for each rate category.

The principal uncertainties inherent in forecasting Residential sales are:

- the electricity requirements of new appliances that may come into use over the next twenty years;
- the capture rate for electric heating which historically has varied significantly and often independently of electricity prices; and
- the number of people per household and the type of housing they choose.

Varying these factors within a range considered to be consistent with the probable economic and energy price forecasts results in a variation in residential sales forecast for 1993/94 of about 700 GW.h or 6%.

The forecast for the General category is influenced by:

- the electrical use per unit of floorspace in commercial and institutional buildings as more efficient lighting and more or less electrical equipment is installed; and
- the electric intensity of the new industry in this rate category.

The General Sales could vary by 1 300 GW.h in 1993/94 as a result of fairly small changes in commercial and institutional use and more or less electric intensive industrial use.

In recent years the growth forecast for the Transmission category has turned out to be too high because new industrial projects have not been developed as quickly as their proponents had hoped and, in the short term, much of the industrial capacity in the province has been operating well below full capacity. In preparing the probable forecast certain industrial projects that were in the 1982 forecast have been removed or delayed and the level of utilization of existing capacity has been lowered.

To arrive at a range around the probable forecast, the level of capacity utilization is varied during the 1980's and thereafter the rate of investment in new energy intensive loads is changed. In the probable low case it is assumed for 1993/94 that the new CTMP mills and mining and smelting loads come in more slowly and that the new investment load is 1 800 GW.h rather than 2 800 GW.h. In the probable high case the load is increased by the 1 000 GW.h for an LNG project, or similar load.

The Other category and the total WKP&L load are varied in proportion to the sum of Residential, General and Transmission loads. In the low case WKP&L would only need to purchase 1 356 GW.h from B. C. Hydro in 1993/94 whereas in the high case they would need 2 368 GW.h. The sales to Seattle City Light are assumed to remain unchanged.

The resulting sensitivity range to the probable forecast is shown below:

	Probable/Low 1993/94 Sales GW.h	Probable 1993/94 Sales GW.h	Probable/High 1993/94 Sales GW.h
Residential	10 848	11 606	12 226
General	11 862	13 151	14 472
Transmission Rate	14 000	14 995	16 000
Other	772	836	898
Total Res., Gen. Trans. & Other	37 482	40 588	43 596
11 Year Growth Rate 1982/83 to 1993/94 (%/yr)	2.6	3.4	4.0
WKP&L	1 356	1 840	2 368
Seattle City Light	318	318	318
Total Billed Sales	39 156	42 746	46 282
Losses & Accruals	5 044	5 454	5 918
Total Gross Requirements	44 200	48 200	52 200
11 Year Growth Rate 1982/83 to 1993/94 (%/yr)	3.1	3.9	4.7

This range of forecasts and the probable forecast are based on electricity prices increasing by 12% between 1983/84 and 1987/88. As the foregoing analysis indicates, factors other than prices, population growth and economic growth could result in a 10% variation in the load forecast by 1993/94. Higher or lower electricity prices, which might vary by 10% from the base

price forecast, would probably only affect the load by up to 5% in this period.

Load Forecasts Based on Low and High Economic Outlooks

In the low economic outlook, B. C. is forecast to have very low or negative economic growth so that the 1981 level of economic activity is not achieved again until 1989. In the long term, economic growth is forecast to average 2.5%/year. Population growth is forecast to grow at 1.7% per annum over the next ten years.

In the high economic outlook, a strong recovery is forecast with economic activity reaching the 1981 level by 1984 and strong growth continuing thereafter.

Approximate estimates of future electricity sales corresponding to the low economic outlook are prepared for each rate category as follows:

Residential - based on the low population growth and lower rates of household formation, appliance requirements and capture rates for electric heat to reflect lower income.

General - based mainly on lower GDP and population forecasts with some additional allowance in the short term for an assumed strike.

Transmission Rate - the low is estimated by decreasing the probable by the ratio of the low to the probable GDP. In 1983/84 and 1984/85 additional adjustments are made to reflect a possible low scenario for utilization of existing industrial capacity.

WKP&L - reduced in proportion to the other loads.

This approach results in a low total requirements forecast of 38 300 GW.h in 1993/94, 20% below the probable. Applying the same approach to arrive at a high forecast results in requirements of 55 100 GW.h in 1993/94.

The following tables present the low, probable and the high forecasts and their bases (Table E 1); the basis for the probable forecast of gross load requirements (Tables E 2 through E 7); and the low, probable and high forecasts for the Integrated System (Table E 8).

TABLE E 1

B. C. HYDRO
PROJECTIONS OF ELECTRIC GROSS LOAD REQUIREMENTS
TOTAL B. C. HYDRO

	July 1983 Forecast										September 1982	
			Range of Probable Forecasts									
	Low		Probable Low		Probable		Probable High		High		Probable	
	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
Fiscal Year												
1981/82 (Actual)	5 939	32 359	5 939	32 359	5 939	32 359	5 939	32 359	5 939	32 359	5 939	32 359
1982/83 (Actual)	5 537	31 513	5 537	31 513	5 537	31 513	5 537	31 513	5 537	31 513	5 537	31 513
1983/84	5 730	31 900	5 830	32 500	6 050	33 690	6 160	34 300	6 350	34 400	6 470	34 320
1984/85	5 930	33 000	6 110	34 000	6 400	35 620	6 540	36 400	6 720	37 400	6 800	36 310
1985/86	6 050	32 900	6 510	35 400	6 900	37 540	7 130	38 800	7 320	39 800	7 070	38 060
1986/87	6 000	32 800	6 640	36 300	7 110	38 890	7 390	40 400	7 500	41 000	7 420	40 290
1987/88	6 180	33 700	6 780	37 000	7 260	39 650	7 660	41 800	7 820	42 700	7 660	42 120
1988/89	6 320	34 600	6 960	38 100	7 500	41 050	7 840	42 900	8 160	44 700	7 930	43 650
1989/90	6 410	35 100	7 110	38 900	7 700	42 190	8 090	44 300	8 470	46 400	8 190	45 340
1990/91	6 510	35 700	7 290	40 000	7 910	43 410	8 350	45 800	8 770	48 100	8 490	47 290
1991/92	6 630	36 500	7 530	41 400	8 150	44 870	8 740	48 100	9 160	50 400	8 880	49 570
1992/93	6 790	37 500	7 770	42 900	8 430	46 550	9 080	50 100	9 570	52 800	9 150	51 150
1993/94	6 920	38 300	7 980	44 200	8 710	48 200	9 430	52 200	9 950	55 100	9 400	52 900
11 Yr. Av. Ann. Growth % (1982/83-1993/94)	2.0	1.8	3.4	3.1	4.2	3.9	5.0	4.7	5.5	5.2	4.9	4.8
1994/95	7 040	38 900	8 180	45 200	8 960	49 500	9 730	53 800	10 400	57 300	9 800	54 700
1995/96	7 220	39 900	8 410	46 500	9 220	51 000	10 100	55 900	10 800	59 900	10 100	56 600
1996/97	7 320	40 500	8 580	47 500	9 460	52 400	10 400	57 600	11 300	62 300	10 400	58 500
1997/98	7 470	41 400	8 800	48 800	9 740	54 000	10 700	59 600	11 700	64 900	10 800	60 500
1998/99	7 620	42 300	9 040	50 200	10 000	55 800	11 100	61 800	12 200	67 700	11 200	62 500
1999/2000	7 760	43 100	9 250	51 400	10 300	57 200	11 500	63 600	12 600	70 100	11 500	64 500
2000/01	7 900	44 000	9 440	52 600	10 600	58 900	11 800	65 500	13 100	72 800	11 800	66 400
2001/02	8 030	44 800	9 680	54 000	10 800	60 500	12 100	67 400	13 500	75 300	12 200	68 400
2002/03	8 160	45 600	9 880	55 200	11 100	62 100	12 400	69 400	14 000	78 100	12 500	70 400
2003/04	8 310	46 600	10 100	56 700	11 400	63 900	12 800	71 600	14 400	80 900	12 900	72 400
10 Yr. Av. Ann. Growth % (1993/94-2003/04)	1.8	2.0	2.4	2.5	2.7	2.9	3.1	3.2	3.8	3.9	3.2	3.2
21 Yr. Av. Ann. Growth % (1982/83-2003/04)	2.0	1.9	2.9	2.8	3.5	3.4	4.1	4.0	4.7	4.6	4.1	4.0

The basis for the probable forecast is presented in Tables E 2 through E 7. The low, probable low, probable high and high electrical forecasts are calculated as follows:

Residential

- the probable-low and probable-high forecasts result from changes in the rate of household formation, electricity capture rate in space heating and increases in 'other' electricity use. The changes cause a variation of 600 to 700 GW.h in 1993/94, or 6% of the probable estimate.

- the low and high forecasts result from applying the respective population forecasts (Table E 3) to the changes incorporated in the probable-low and probable-high forecasts. The changes cause an additional variation of 200 GW.h in 1993/94, or an additional 2% from the probable forecast.

FOOTNOTES TO TABLE E 1 CONTINUED

General

- the probable-low and probable-high forecasts result mainly from changes in the rate of implementation of new conservation measures. The changes cause a variation of 1 300 GW.h in 1993/94, or 10% of the probable estimate.

- the low and high forecasts result from applying the respective GDP forecasts (Table E 3) with some additional effect due to strikes in the low estimate, or fast recovery in one sector in the high estimate. The changes cause an additional variation of 500 to 1 700 GW.h in 1993/94, or an additional 4 to 13% of the probable estimate.

Transmission Rate

- the probable-low and probable-high forecasts result from an assumed strike in the short term, and somewhat slower or faster investment in particular industries. The changes cause a variation of 1 000 GW.h in 1993/94, or 7% of the probable estimate.

- the low and high forecasts result from strikes or faster recovery in the short term, and by applying the respective GDP forecasts in long term. The changes cause an additional variation of 1 400 to 2 400 GW.h in 1993/94, or 9 to 16% of the probable estimate.

Other:

For each forecast, the 'other' load is varied in proportion to the sum of the Residential, General and Transmission Rate loads.

WKP&L

For each forecast, the WKP&L and Cominco total load is varied in proportion to the sum of the Residential, General, Transmission Rate and Other loads. Local generation is deducted from the total requirements, and the residual is assumed to be supplied by B. C. Hydro.

TABLE E 2

B. C. HYDRO
HISTORIC AND PROBABLE PROJECTIONS OF ELECTRIC POWER REQUIREMENTS
BY SALES CATEGORIES

Fiscal Year	Residential (GW.h)	General (GW.h)	Trans. Rate (GW.h)	Other (GW.h)	Total Res. Gen. Trans. & Other (GW.h)	WKP&L (GW.h)	Seattle City Light (GW.h)	Total Billed Sales (GW.h)	Losses & Accruals (GW.h)	Total Gross Requirements (GW.h)	Peak (MW)
HISTORIC											
1972/73	4 739	5 659	7 066	453	17 917			17 917	2 432	20 349	3 653
1973/74	5 176	6 378	7 776	470	19 800			19 800	2 656	22 456	3 739
1974/75	5 685	6 685	7 714	495	20 579			20 579	2 815	23 394	3 957
1975/76	6 258	7 062	6 808[a]	532	20 660			20 660	2 878	23 538	4 232
1976/77	6 625	7 592	8 166	541	22 924			22 924	3 072	25 996	4 421
1977/78	7 051	8 073	8 479	561	24 164			24 164	3 372	27 536	4 800
1978/79	7 492	8 512	9 133	583	25 720			25 720	3 628	29 348	5 122
1979/80	7 727	8 949	9 217	625	26 518			26 518	3 455	29 973	5 231
1980/81	8 042	9 344	9 597	581	27 564			27 564	3 594	31 158	5 511
1981/82	8 640	9 706	9 339[a]	609	28 294	14		28 308	4 051	32 359	5 939
1982/83	8 821	9 704	9 046	620	28 191	15		28 206	3 307	31 513	5 537
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	6.4	5.5	2.5	3.2	4.6	-		4.6	-	4.5	4.2
PROJECTIONS											
1983/84	9 196	9 966	9 825	633	29 620	120		29 740	3 950	33 690	6 050
1984/85	9 461	10 377	10 810	645	31 293	180		31 473	4 147	35 620	6 400
1985/86	9 748	10 842	11 545	661	32 796	260	136	33 192	4 348	37 540	6 900
1986/87	10 002	11 156	11 830	680	33 668	420	318	34 406	4 484	38 890	7 110
1987/88	10 255	11 391	11 905	700	34 251	500	318	35 069	4 581	39 650	7 260
1988/89	10 506	11 644	12 475	722	35 347	660	318	36 325	4 725	41 050	7 500
1989/90	10 746	11 902	12 835	743	36 226	800	318	37 344	4 846	42 190	7 700
1990/91	10 972	12 174	13 250	766	37 162	950	318	38 430	4 980	43 410	7 910
1991/92	11 183	12 466	13 760	788	38 197	1 230	318	39 745	5 125	44 870	8 150
1992/93	11 387	12 767	14 415	812	39 381	1 560	318	41 259	5 291	46 550	8 430
1993/94	11 606	13 151	14 995	836	40 588	1 840	318	42 746	5 454	48 200[b]	8 710
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	2.5	2.8	4.7	2.8	3.4	-	-	3.9		3.9	4.2
1994/95	11 885	13 474	15 470	857	41 686	1 930	318	43 934	5 566	49 500	8 960
1995/96	12 196	13 890	15 970	880	42 936	2 020	318	45 274	5 726	51 000	9 220
1996/97	12 455	14 257	16 480	901	44 093	2 110	318	46 521	5 879	52 400	9 460
1997/98	12 762	14 610	17 010	924	45 306	2 320	318	47 944	6 056	54 000	9 740
1998/99	13 202	14 987	17 550	948	46 687	2 500	318	49 505	6 295	55 800	10 000
1999/2000	13 440	15 365	18 110	973	47 888	2 600	318	50 806	6 394	57 200	10 300
2000/01	13 707	15 861	18 690	998	49 256	2 700	318	52 274	6 626	58 900	10 600
2001/02	13 986	16 248	19 290	1 024	50 548	2 800	318	53 666	6 834	60 500	10 800
2002/03	14 297	16 673	19 910	1 049	51 929	2 910	318	55 157	6 943	62 100	11 100
2003/04	14 649	17 110	20 545	1 075	53 379	3 010	318	56 707	7 193	63 900	11 400
Av. Ann. Growth: % 10 Yrs: 93/94-03/04	2.4	2.7	3.2	2.5	2.8	5.0	-	2.9	-	2.9	2.7
% 21 Yrs: 82/83-03/04	2.4	2.7	4.0	2.7	3.1	-	-	3.4	-	3.4	3.5

[a] There were forestry industry strikes in 1975/76 and 1981/82 causing reductions in bulk sales.
[b] The 1993/94 electricity requirements in this forecast have slipped by two and one-half years relative to the September 1982 Probable Forecast.

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TABLE E 3

BRITISH COLUMBIA
DEMOGRAPHIC AND ECONOMIC FORECASTS

HISTORIC TRENDS

Calendar Year	Population (Thousands)	Labour Force (Thousands)	Unemployment Rate (percent)	GDP (Billions of 1971 Dollars)
1982 (Actual)	2 783	1 346	12.1	15.4
Av. Ann. Growth: % 10 Yrs: 1972-1982	2.2			3.2

JULY 1983 FORECAST

1983	2 817	1 377	13.5	15.7
1984	2 865	1 416	12.5	16.6
1985	2 920	1 456	11.5	17.6
1986	2 979	1 490	11.0	18.4
1987	3 040	1 522	10.5	18.7
1988	3 104	1 556	9.0	19.4
1989	3 169	1 591	9.0	20.2
1990	3 237	1 628	9.0	21.0
1991	3 306	1 666	9.0	21.9
1992	3 376	1 706	9.0	22.8
1993	3 448	1 747	7.5	23.6
Av. Ann. Growth: % 11 Yrs: 1982-1993	2.0	2.4		4.0
2002	4 111	2 186	7.5	32.2
Av. Ann. Growth: % 9 Yrs: 1993-2002	2.0	2.5		3.5

COMPARISON WITH PREVIOUS FORECAST

For the year 1993:

July 1983 Forecast	3 448	23.6
July 1982 Forecast	3 401	24.1

LOW AND HIGH FORECASTS

	Population Growth			Real GDP Growth		
	Low	Probable	High	Low	Probable	High
	- %/year -			- %/year -		
1982 to 1993	1.7	2.0	2.2	1.4	4.0	5.1
1993 to 2002	1.6	2.0	2.1	2.5	3.5	4.7

TABLE E 4

HISTORIC AND FORECAST
ELECTRICITY, NATURAL GAS AND CRUDE OIL PRICES
(1982 Dollars)

	B. C. Hydro Average Selling Price			Vancouver Blended Crude Oil	
	Electricity		Natural Gas		
	¢/kW.h	$/GJ	$/GJ	$/GJ	$/bbl
Actual					
1971/72	3.45	9.58	2.15	1.35	8.27
1976/77	3.33	9.25	2.29	2.56	15.66
1981/82	3.42	9.50	3.60	5.11	31.28
1982/83	3.75	10.42	3.85	5.59	34.21
Forecast					
1983/84	3.75	10.42	3.85	5.38	32.93
1984/85	3.86	10.72	3.97	5.01	30.65
1985/86	3.98	11.06	4.08	4.93	30.20
1986/87	4.09	11.36	4.20	4.76	29.11
1987/88	4.20	11.67	4.31	4.75	29.07
1988/89	4.20	11.67	4.31	4.68	28.67
1989/90	4.20	11.67	4.31	4.65	28.46
1990/91	4.20	11.67	4.31	4.75	29.04
1991/92	4.20	11.67	4.31	4.79	29.29
1992/93	4.20	11.67	4.31	4.85	29.68
1993/94	4.20	11.67	4.31	4.89	29.92
2003/04	4.20	11.67	4.31	5.09	31.18

Note:

Conversion factors: Electricity 277.8 kW.h = 1 GJ
Crude Oil .1634 barrel = 1 GJ

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TABLE E 5

RESIDENTIAL ELECTRIC SALES PROJECTIONS
(Billed basis, no adjustment for accrual)

Year	Average Residential[a] Accounts (000)	Percent[b] Electric Heating (%)	Annual Average Use Per Account:[c] Non Electric Heating (kW.h)	Electric Heating (kW.h)	All Accounts (kW.h)	Total of[d] Sales (GW.h)
1981/82 (Actual)	929.8	14.2	8 129	16 320	9 292	8 640
1982/83 (Actual)	957.2	15.4	8 127	15 211	9 216	8 821
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	4.0	-	2.0	-2.2	2.4	6.4
1983/84	979.3	16.3	8 120	15 920	9 390	9 196
1984/85	1 005.3	17.2	8 115	15 655	9 410	9 461
1985/86	1 034.2	18.1	8 110	15 390	9 425	9 748
1986/87	1 063.9	18.7	8 085	15 115	9 400	10 002
1987/88	1 093.8	19.3	8 065	14 860	9 375	10 255
1988/89	1 124.7	19.9	8 030	14 615	9 340	10 506
1989/90	1 156.2	20.4	7 990	14 380	9 295	10 746
1990/91	1 188.1	20.9	7 940	14 145	9 235	10 972
1991/92	1 219.6	21.3	7 880	13 920	9 170	11 183
1992/93	1 251.5	21.7	7 820	13 700	9 100	11 387
1993/94	1 283.8	22.1	7 770	13 505	9 040	11 606
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	2.7	-	-0.4	-1.1	-0.2	2.5

[a] Developed from the population forecast by applying headship rates and factors to distribute households by type of dwelling. In 1982/83, the B. C. Hydro household dwelling mix was 65% houses, 3% row houses, 23% apartments, 5% mobile, and 4% seasonal. In 1993/94, the mix is forecast to be 60%, 7%, 25%, 5% and 4%, respectively.

[b] The relative costs of gas and electric space heating have been calculated historically based on average residential rates. From the historic relation between relative price and actual capture rates, the 1983/84 capture rates for electric space heating have been estimated to be 20% for single family dwellings, 65% for row housing and 55% for apartments (excluding Vancouver Island). Although electricity and gas prices are forecast to increase proportionally, gas furnace efficiencies are projected to improve and, as a result, the capture rates for electric heating are projected to decline slightly over the forecast period. The overall average, with gas becoming available on Vancouver Island in 1986/87, is 42% between 1982/83 and 1993/94.

[c] The electricity use for non-electrically heated households is a function of the projections of the numbers of appliances per household and the use per appliance. During the forecast period households are projected to have greater numbers of appliances but because they are more efficient the use per household does not increase. The decline in use for electrically heated households results from a greater proportion of row houses and apartments, as well as from higher insulation levels in new dwellings and other conservation efforts.

[d] The total sales have been projected taking into account anticipated effects of conservation. Without this conservation the 1993/94 residential sales would be 1 200 GW.h higher and the 2003/04 sales 2 650 GW.h higher. These savings result in part from the gradual replacement of old appliances with new ones currently available and the growing proportion of houses that are and will be built to current insulations standards. These changes in use, which result in part from past price increases and will tend to proceed without future price increases, account for 370 GW.h of the conservation in 1993/94 and 650 GW.h in 2003/04. The greater part of the conservation, 830 GW.h in 1993/94 and 2000 GW.h in 2003/04 result from future improvements beyond today's standards and tend to be related to future price changes in B. C. and elsewhere.

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TABLE E 6

GENERAL ELECTRIC SALES PROJECTIONS
(Billed basis, no adjustment for accrual)

	Small Industrial[a] (GW.h)	Commercial Classified[b] (GW.h)	Commercial Unclassified[c] (GW.h)	Total (GW.h)
1981/82 (Actual)	2 710	5 295	1 701	9 706
1982/83 (Actual)	2 680	6 259	765	9 704
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	n/a	n/a	n/a	5.5
1983/84	2 769	6 413	784	9 966
1984/85	3 007	6 567	803	10 377
1985/86	3 176	6 831	835	10 842
1986/87	3 296	7 004	856	11 156
1987/88	3 363	7 154	874	11 391
1988/89	3 417	7 331	896	11 644
1989/90	3 474	7 510	918	11 902
1990/91	3 540	7 694	940	12 174
1991/92	3 614	7 888	964	12 466
1992/93	3 690	8 088	989	12 767
1993/94	3 831	8 305	1 015	13 151
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	3.3	2.6	2.6	2.8

[a] Small industrial sales in 1982/83 consist primarily of wood manufacturing (46%) and other manufacturing (37%). Wood manufacturing follows the trend in lumber production which, in turn, is consistent with B. C. Hydro's economic outlook for the forestry industry in general. Other manufacturing 1982/83 sales in the general category are combined with Transmission Rate manufacturing loads (crude oil refining, cement and other non-metalic minerals), and these total electricity requirements are increased at the manufacturing GDP growth rate which has certain manufacturing components such as pulp and paper removed. The resulting total electricity requirements are reduced by specific estimates for Transmission Rate manufacturing loads to derive the General manufacturing load. The remaining general industrial loads are for Agriculture (1.1% of industrial 1982/83 sales), Forestry (1.2%), Fishing and Trapping (0.7%), Mines (including milling) and Quarries (4.5%), Chemicals and Chemical Products (2.9%) and Paper and Allied Products (5.7%), together consuming 16.1% of industrial 1982/83 sales and growing at 2.6% per year based on various components of GDP.

[b] Commercial Sales consist of: elementary, secondary and post-secondary education facilities and hospitals (consuming 11% of commercial sales in 1982/83) and growing at 1.7% per year based on growth in certain population age groups related to floorspace requirements and unit electric energy use; retail, food store, food service, office and accomodation facilities (consuming 50% of commercial sales in 1982/83) and growing at 2.8% per year based on growth in retail sales, office employment and GDP related to floorspace requirements and unit electric energy use; Construction (2.6% commercial sales in 1982/83), Transportation (5.2%), Communications and Utilities (4.0%), Amusement and Recreation facilities (3.5%) and Government services not utilizing office floorspace (2.3%), together consuming 17.6% of commercial sales in 1982/83, and growing at various rates based on sectoral GDP growth averaging 3.2% per year; Storage (2.1% of commercial sales in 1982/83), Wholesale Trade (4.8%), Religious Organizations (0.6%), common areas in apartment buildings (2.6%) and Trailer Parks (0.2%), together consuming 10.0% of commercial sales in 1982/83 and growing at 1.8% per year based on various trends in population, apartment, and trade growth.

[c] Continued classification by SIC code indicates almost all unclassified loads are commercial. Unclassified load grows at the average growth in commercial classified sales.

TABLE E 7

TRANSMISSION RATE ELECTRIC SALES PROJECTIONS

Year	Pulp & Paper[a] GW.h	Wood Manufacturing[b] GW.h	Chemicals for Pulp & Paper[c] GW.h	Metal Mining[d] GW.h	Smelting[e] GW.h	Coal Mining[f] GW.h	Other[g] GW.h	Total GW.h
1981/82 (Actual)	4 271	223	1 241	2 637	-	326	641	9 339
1982/83 (Actual)	4 465	256	1 018	2 340	-	294	673	9 046
Av. Ann. Growth: %								
10 Yrs: 72/73-82/83	1.4	7.7	-1.1	4.8	-	4.9	9.0	2.5
1983/84	4 930	280	1 200	2 350	-	350	715	9 825
1984/85	5 370	310	1 400	2 500	-	455	775	10 810
1985/86	5 710	335	1 440	2 700	-	530	830	11 545
1986/87	5 710	345	1 440	2 900	-	575	860	11 830
1987/88	5 710	345	1 440	2 900	-	580	930	11 905
1988/89	5 960	345	1 460	3 050	-	650	1 010	12 475
1989/90	6 210	345	1 470	3 100	-	675	1 035	12 835
1990/91	6 510	345	1 490	3 100	-	750	1 055	13 250
1991/92	6 860	345	1 490	3 200	-	780	1 085	13 760
1992/93	7 250	345	1 500	3 300	110	800	1 110	14 415
1993/94	7 600	345	1 510	3 300	260	840	1 140	14 995
Av. Ann. Growth: %								
11 Yrs: 82/83-93/94	5.0	2.7	3.6	3.2	-	10.0	4.9	4.7

[a] The 3 100 GW.h increase in 1993/94 over 1982/83 is split evenly between higher utilization of existing capacity and new production facilities. The new production is largely market bleached chemi-thermo-mechanical pulp (1 300 GW.h) which requires approximately three times as much electrical energy per unit of finished product as market chemical pulp and about five time as much purchased electricity because chemical pulp mills self generate a substantial proportion of their electric requirements. Approximately 300 GW.h of the requirements result from the substitution of thermo-mechanical pulp for stone groundwood at existing mills.

[b] The small increase is due to higher utilization of existing facilities. The largest portion of wood manufacturing (over 80%) is contained in the small industrial portion of General sales.

[c] The growth in requirements for the chemicals industry reflect the projected recovery for the existing chemical pulp industry between now and 1986.

[d] The increase of 960 GW.h between 1982/83 and 1993/94 is the result of 350 GW.h for bringing existing capacity back to normal utilization, 400 GW.h for increased production at Bethlehem/Valley Copper, 40 GW.h for Trout Lake (a new molybdenum mine), 170 GW.h for new capacity at existing copper mines. In 1993/94, 90% of the electricity consumption is in copper mines with the remainder being largely in molybdenum mines.

[e] The 260 GW.h in 1993/94 is for a new copper smelter (230 GW.h full load) projected to start in 1992 and 30 GW.h for Cominco to enable the establishment of a ferrosilicon plant in their area with initial production projected for 1992 as well.

[f] Of the 545 GW.h increase projected by 1993/94, 480 GW.h is for existing or under development mines to utilize capacity. Excess mine capacity is still projected to exist in 1993/94 with coking coal capacity utilization averaging 50% to 60% through the period. The load for the Southeast area is projected at 555 GW.h and the Northeast at 220 GW.h. The only new coal mines projected are small, high quality thermal coal mines located close to port. The two projected to be supplied by B. C. Hydro are Quinsam and Telkwa and will have a consumption of 65 GW.h in 1993/94.

[g] Other bulk customers are oil refineries, cement plants, grain and coal terminals, other transportation (pumping and electrification), UBC, NGL extraction and other loads. Growth is projected based on known plans and projected requirements to handle industrial and commercial expansion. The petrochemical loads projected in the September 1982 forecast are now not projected to occur through 1993/94. A small scale NGL extraction facility projected to start operation in 1987 is the only natural gas related load projected through 1993/94.

TABLE E 8

B. C. HYDRO
PROJECTIONS OF ELECTRIC GROSS LOAD REQUIREMENTS
INTEGRATED SYSTEM

	July 1983 Forecast										September 1982	
	Range of Probable Forecasts											
	Low		Probable Low		Probable		Probable High		High		Probable	
	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
Fiscal Year												
1981/82 (Actual)	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186
1982/83 (Actual)	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354
1983/84	5 700	31 750	5 800	32 345	6 010	33 530	6 120	34 140	6 310	35 235	6 430	34 150
1984/85	5 900	32 850	6 070	33 840	6 360	35 455	6 500	36 235	6 680	37 230	6 760	36 130
1985/86	6 020	32 750	6 470	35 240	6 860	37 370	7 090	38 630	7 280	39 620	7 030	37 875
1986/87	5 970	32 650	6 600	36 135	7 070	38 715	7 350	40 220	7 460	40 810	7 380	40 100
1987/88	6 150	33 550	6 740	36 830	7 220	39 470	7 620	41 610	7 780	42 500	7 620	41 920
1988/89	6 280	34 440	6 920	37 920	7 460	40 860	7 800	42 700	8 110	44 490	7 880	43 440
1989/90	6 370	34 940	7 070	38 720	7 660	41 990	8 040	44 090	8 420	46 180	8 140	45 120
1990/91	6 470	35 530	7 250	39 810	7 860	43 200	8 300	45 580	8 720	47 870	8 440	47 060
1991/92	6 590	36 320	7 490	41 200	8 100	44 650	8 690	47 870	9 110	50 150	8 830	49 330
1992/93	6 750	37 320	7 720	42 690	8 380	46 320	9 030	49 860	9 510	52 540	9 100	50 900
1993/94	6 880	38 110	7 930	43 980	8 660	47 960	9 370	51 940	9 890	54 820	9 340	52 600
11 Yr. Av. Ann. Growth % (1982/83-1993/94)	2.0	1.8	3.4	3.1	4.2	3.9	4.9	4.7	5.5	5.2	4.9	4.8
1994/95	7 000	38 700	8 130	44 900	8 910	49 200	9 670	53 500	10 340	57 000	9 740	54 400
1995/96	7 170	39 700	8 360	46 200	9 160	50 700	10 040	55 600	10 730	59 600	10 040	56 300
1996/97	7 270	40 300	8 530	47 200	9 400	52 100	10 330	57 300	11 230	62 000	10 340	58 200
1997/98	7 420	41 200	8 740	48 500	9 680	53 700	10 630	59 300	11 630	64 600	10 740	60 200
1998/99	7 570	42 100	8 980	49 900	9 940	55 500	11 030	61 500	12 120	67 300	11 140	62 200
1999/2000	7 710	42 900	9 190	51 100	10 230	56 900	11 430	63 300	12 520	69 700	11 440	64 200
2000/01	7 840	43 800	9 380	52 300	10 530	58 600	11 720	65 200	13 010	72 400	11 740	66 100
2001/02	7 970	44 600	9 610	53 700	10 730	60 200	12 020	67 000	13 410	74 900	12 140	68 100
2002/03	8 100	45 400	9 810	54 900	11 030	61 800	12 320	69 000	13 910	77 700	12 440	70 100
2003/04	8 250	46 400	10 030	56 400	11 330	63 600	12 720	71 200	14 310	80 500	12 840	72 100
10 Yr. Av. Ann. Growth % (1993/94-2003/04)	1.8	2.0	2.4	2.5	2.7	2.9	3.1	3.2	3.8	3.9	3.2	3.2
21 Yr. Av. Ann. Growth % (1982/83-2003/04)	1.9	1.9	2.9	2.8	3.5	3.4	4.1	4.0	4.7	4.6	4.1	4.0

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GAS SERVICE

GAS SERVICE

The gas service forecasts are presented in metric units. The basic unit of gas measurement in the metric system is the Joule (J). The metric unit adopted by B. C. Hydro for billing purposes is called the Billing Unit (BU) which is equal to 10^8 J or 0.1 GJ. The conversion of imperial units to the metric system is based on the relationship British Thermal Units (BTU) × 1 054.6 equals Joules.

1. Three projections have been prepared for natural gas sales on the Lower Mainland for the 20 year period ending 2003/04 viz a probable, low and high forecast. These three projections are the same for the Liquid Petroleum Gas (LPG) load in Victoria. System plans and operating budgets will be based on the probable forecast. General long range financial analyses will also be prepared on the probable forecast and, if required, on the low and high forecasts as well.

2. Although natural gas is assumed to be on Vancouver Island in fiscal year 1986/87 in the electric forecast, the low, probable and high natural gas projections herein for the Lower Mainland do not include an allowance for sales of natural gas on Vancouver Island for the following reasons:

   (a) The decision to proceed with the Vancouver Island pipeline project has not yet been made and will be the subject of future public hearings.

   (b) The location of the pipeline crossing, which company would build and operate the underwater pipeline and who would transmit and distribute natural gas on Vancouver Island are also questions yet to be answered.

3. TABLES G 1 and G 2 are based on the assumption that Compressed Natural Gas (CNG) will be actively promoted for automotive purposes and that this fuel will be very competitive with gasoline. TABLE G 3 shows the anticipated CNG load broken down into firm and interruptible components. The demand for CNG is essentially based on the projections prepared for B. C. Hydro by Canadian Resourcecon Limited in December 1981. The demand in the first six years has been reduced somewhat. In 1993/94 the CNG load is expected to make up 3.9% of the total load and in 2003/04 about 5.8%.

4. TABLE G 1 shows the current probable, low and high projections as well as the probable forecast prepared in September 1982 for comparison. The history of normalized sales is based on the firm load normalized for weather and the interruptible load normalized for weather, adjusted for strikes and 30 days of curtailment. Relative to this normalized sales volume, the current average annual growth rates (with last year's growth rates shown in brackets) are as follows:

	1982/83 to 1993/94		1993/94 to 2003/04		1982/83 to 2003/04	
	July/83	Sept/82	July/83	Sept/82	July/83	Sept/82
Probable	2.9 %	(3.0 %)	2.7 %	(2.9 %)	2.8 %	(3.0 %)
Low	2.0 %	(2.0 %)	2.0 %	(2.3 %)	2.0 %	(2.2 %)
High	3.8 %	(4.0 %)	3.3 %	(3.4 %)	3.5 %	(3.7 %)

The firm and interruptible loads in 1993/94 for the two probable forecasts compare as follows:

	Sales (10^6 BU)		1982/83 to 1993/94 Av. Ann. Growth Rates (%)	
	July/83	Sept/82	July/83	Sept/82
Basic Firm	970.4	1 036.6	2.9	3.2
Interruptible	248.7	271.0	2.7	2.1
Total	1 219.1	1 307.6	2.9	3.0

The current projections are somewhat lower than the ones prepared last year. This is essentially due to a reduction in the commercial and the interruptible components of the load compared with last year. The two main reasons for this are:

(a) It is becoming increasingly evident that it is not very likely that major natural gas consuming projects will be located in the Lower Mainland area as a result of strong public environmental concerns.

(b) The relative cost of natural gas with respect to oil within the forecast period is expected to increase significantly.

(c) The strong possibility that the two cement plants, which are the largest customers, will switch at least a substantial part of their load away from natural gas.

5. It is not intended to list the detailed assumptions upon which the three projections are based in this summary. The major ones are as follows:

(a) The residential component of the load in the three projections are closely related to the population forecasts contained in B. C. Hydro's Long Term Economic Outlook published in 1983.

(b) The general component of the load in the three forecasts are based on the GDP projections shown in the same document.

(c) The residential electric and natural gas forecasts were closely integrated for the Lower Mainland area.

(d) The relative prices of electricity, natural gas and oil in the residential market have been determined for the forecast period. They indicate that natural gas is expected to maintain its competitive position in the new housing market relative to electricity. The relative cost of natural gas with respect to oil is expected to increase, however.

(e) The effect of energy conservation on the residential and commercial load has been reassessed in light of the most recent information obtained from the Energy Services Division of B. C. Hydro.

(f) The rate of conversions of residential dwellings from oil to natural gas has been reduced relative to last year's assumptions (from 42 400 units to 21 500 units) on the basis of recent performance, the current economic conditions, reduced interest rates, incentives provided by the Federal Government, cost relationships of alternative energy forms for space heating and a recent re-evaluation of existing housing stock with oil space heating.

(g) Capture rates for the various types of dwellings have been determined considering past performance, capital cost differences, differences in operating cost, rent control and the availability of high efficiency equipment.

(h) The shift in 1981 from single family dwellings to row houses and apartments is expected to continue although to a less extreme degree than occurred in that year. The composition of the new housing mix that came on the market in the Lower Mainland in 1982 was as follows: singles 25%, duplexes 2%, row houses 22% and apartments 51%. The relative market shares in 1993/94 were assumed to be: singles 35%, duplexes 3%, row houses 26% and apartments 36%. The validity of this trend was also confirmed in discussions with authorities in the housing industry.

(i) LPG sales on Vancouver Island are expected to reach system capacity in 1983/84 and stay at that level from then on. As was stated earlier under (2), the projection of gas sales in the Victoria area does not include the assumption that natural gas will be available on Vancouver Island.

6. TABLE G 2 attached shows the 20 year probable natural gas sales projection broken down in basic firm sales and interruptible sales. Total sales shows a historic average annual compound growth rate of 3.2% which compares with an anticipated growth rate of 2.8% for the next 21 year period.

TABLE G 1

B. C. HYDRO
PROJECTIONS OF NATURAL GAS AND L.P. GAS SALES
LOWER MAINLAND - VANCOUVER ISLAND
(Lower Mainland Projections Includes CNG)
(Billed basis, no adjustment for accrual)
(Thousand BU)[a, b]

Fiscal Year	1983 Low Projection Prepared July 1983		1983 Probable Projection Prepared July 1983		1983 High Projection Prepared July 1983		1982 Probable Projection Prepared Sept. 1982	
	Lower Mainland Natural Gas	Vancouver Island L.P. Gas	Lower Mainland Natural Gas	Vancouver Island L.P. Gas	Lower Mainland Natural Gas	Vancouver Island L.P. Gas	Lower Mainland Natural Gas	Vancouver Island L.P. Gas
1982/83 (Actual)	884 194	3 253	884 194	3 253	884 194	3 253	884 194	3 749
(Actual Normalized)[c]	891 980		891 980		891 980		891 980	
1983/84	915 700	4 014	921 100	4 014	924 700	4 014	982 570	4 014
1984/85	943 890	4 014	957 110	4 014	968 410	4 014	1 018 030	4 014
1985/86	963 510	4 014	985 540	4 014	1 010 740	4 014	1 044 800	4 014
1986/87	977 950	4 014	1 012 000	4 014	1 049 500	4 014	1 077 050	4 014
1987/88	994 120	4 014	1 042 990	4 014	1 092 690	4 014	1 112 310	4 014
1988/89	1 015 370	4 014	1 075 140	4 014	1 137 140	4 014	1 145 140	4 014
1989/90	1 033 430	4 014	1 102 580	4 014	1 177 480	4 014	1 176 120	4 014
1990/91	1 051 610	4 014	1 132 230	4 014	1 220 030	4 014	1 209 880	4 014
1991/92	1 069 360	4 014	1 158 390	4 014	1 259 690	4 014	1 240 820	4 014
1992/93	1 088 490	4 014	1 188 220	4 014	1 300 720	4 014	1 273 750	4 014
1993/94	1 107 990	4 014	1 219 150[d]	4 014	1 343 650	4 014	1 307 570	4 014
1994/95	1 127 020	4 014	1 250 440	4 014	1 387 140	4 014	1 344 620	4 014
1995/96	1 148 260	4 014	1 283 570	4 014	1 432 770	4 014	1 383 790	4 014
1996/97	1 171 500	4 014	1 318 490	4 014	1 481 790	4 014	1 425 050	4 014
1997/98	1 194 940	4 014	1 354 900	4 014	1 531 600	4 014	1 468 330	4 014
1998/99	1 219 270	4 014	1 392 500	4 014	1 583 200	4 014	1 512 020	4 014
1999/2000	1 244 890	4 014	1 431 230	4 014	1 635 030	4 014	1 557 390	4 014
2000/01	1 271 070	4 014	1 470 780	4 014	1 688 680	4 014	1 604 290	4 014
2001/02	1 297 390	4 014	1 509 920	4 014	1 742 020	4 014	1 651 170	4 014
2002/03	1 324 100	4 014	1 550 430	4 014	1 796 630	4 014	1 699 050	4 014
2003/04	1 351 810	4 014	1 592 420[d]	4 014	1 853 420	4 014	1 747 200	4 014
Av. Ann. Growth: % (Normalized Base)								
11 Yrs: 82/83-93/94	2.0	-	2.9	-	3.8	-	3.5	-
10 Yrs: 93/94-03/04	2.0	-	2.7	-	3.3	-	2.9	-
21 Yrs: 82/83-03/04	2.0	-	2.8	-	3.5	-	3.3	-

NOTES:

a BU = Billing Unit = 10^8 Joules.
b Imperial to metric conversion for information: 1 BTU = 1,054.6 Joules.
c Normalized for weather and normal 30 day curtailment of interruptible sales.
d In 1993/94 the CNG load is expected to make up 3.9% of the total load and in 2003/04 about 5.8%.

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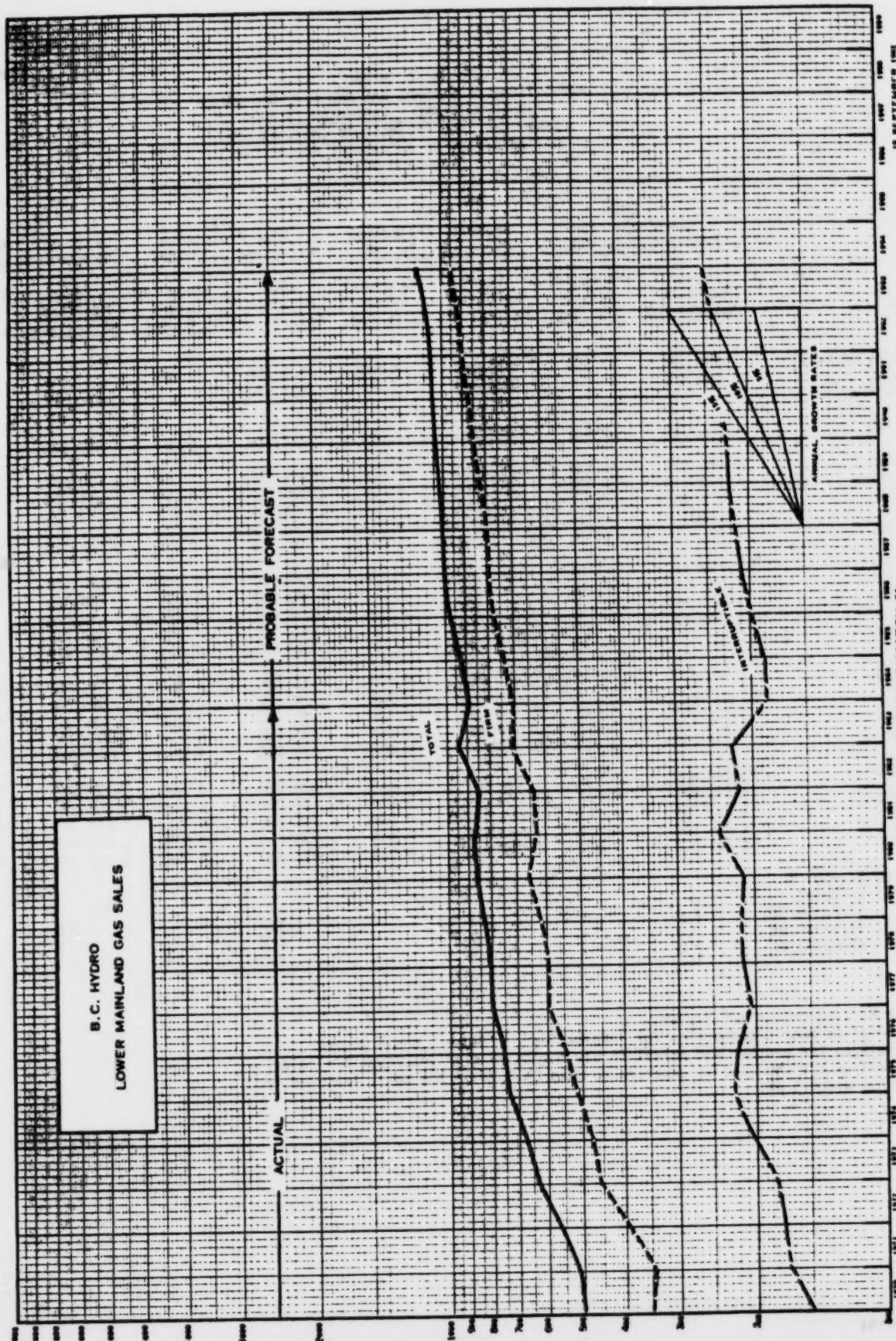
Figure G-1


B.C. HYDRO
LOWER MAINLAND GAS SALES
ACTUAL
PROBABLE FORECAST
TOTAL
FIRM
INTERRUPTIBLE
ANNUAL GROWTH RATES
GAS SALES - MILLIONS OF BILLING UNITS
FISCAL YEARS ENDING MARCH 31

B. C. HYDRO

TABLE G 2

HISTORY AND PROBABLE PROJECTION OF NATURAL GAS SALES
(Excludes L.P. Gas Sales on Vancouver Island
but includes CNG Sales on Lower Mainland)
(10^3 BU)

Fiscal Year	Basic Firm		Interruptible				Total	
	Actual Volume	Normal Volume	Actual Volume	Actual Days Curtailed	Normal Volume	Normal Days Curtailed	Actual Volume	Normal Volume
1972/73	470 887	451 110	201 018	28	200 321	30	671 905	651 431
1973/74	513 048	510 996	224 658	12	214 600	30	737 706	725 596
1974/75	540 955	538 250	222 016	18	216 334	30	762 971	754 584
1975/76	599 349	571 180	201 501	16.8	205 923	30	800 850	777 103
1976/77	592 464	606 683	213 352	15.5	213 566	30	805 816	820 249
1977/78	618 131	627 403	214 895	23.5	211 746	30	833 026	839 149
1978/79	656 217	643 749	212 818	40.8	224 503	30	869 035	868 252
1979/80	630 923	630 923	240 268	17.9	231 667	30	871 191	862 590
1980/81	642 196	681 370	217 577	9.4	222 109	30	859 773	903 479
1981/82	714 853	723 260	224 844	2.8	214 965	30	939 697	938 225
1982/83	684 637	706 350	199 557	0	185 630	30	884 194	891 980
Av. Ann. Growth: %								
10 Yrs:								
72/73-82/83	3.8	4.6	(0.1)		(0.8)		2.8	3.2
1983/84		734 350			186 750			921 100
1984/85		757 280			199 830			957 110
1985/86		774 870			210 670			985 540
1986/87		795 790			216 210			1 012 000
1987/88		821 080			221 910			1 042 990
1988/89		846 970			228 170			1 075 140
1989/90		870 420			232 160			1 102 580
1990/91		895 440			236 790			1 132 230
1991/92		917 750			240 640			1 158 390
1992/93		943 500			244 720			1 188 220
1993/94		970 440			248 710			1 219 150
1994/95		997 840			252 600			1 250 440
1995/96		1 026 960			256 610			1 283 570
1996/97		1 057 850			260 640			1 318 490
1997/98		1 090 210			264 690			1 354 900
1998/99		1 123 630			268 870			1 392 500
1999/00		1 158 370			272 860			1 431 230
2000/01		1 193 820			276 960			1 470 780
2001/02		1 228 830			281 090			1 509 920
2002/03		1 265 120			285 310			1 550 430
2003/04		1 302 850			289 570			1 592 420
Av. Ann. Growth: %								
11 Yrs: 82/83-93/94		2.9			2.7			2.9
10 Yrs: 93/94-03/04		3.0			1.5			2.7
21 Yrs: 82/83-03/04		3.0			2.1			2.8

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TABLE G 3

B. C. HYDRO
PROJECTIONS OF COMPRESSED NATURAL GAS
LOWER MAINLAND
(included in Low, Probable and High Total Projections)
(Thousand BU)[a]

Fiscal Year	LOW PROJECTION			PROBABLE PROJECTION			HIGH PROJECTION		
	Firm	Inter-ruptible	Total	Firm	Inter-ruptible	Total	Firm	Inter-ruptible	Total
1982/83	169	120	289	169	120	289	169	120	289
1983/84	200	800	1 000	350	950	1 300	350	950	1 300
1984/85	270	1 070	1 340	930	1 930	2 860	930	1 930	2 860
1985/86	1 100	1 410	2 510	3 670	2 570	6 240	3 670	2 570	6 240
1986/87	2 630	1 490	4 120	8 760	2 710	11 470	8 760	2 710	11 470
1987/88	4 640	1 660	6 300	15 460	3 010	18 470	15 460	3 010	18 470
1988/89	6 760	1 960	8 720	22 520	3 570	26 090	22 520	3 570	26 090
1989/90	8 690	2 110	10 800	27 590	3 860	31 450	27 590	3 860	31 450
1990/91	9 680	2 220	11 900	33 530	4 890	38 420	33 530	4 890	38 420
1991/92	9 920	2 310	12 230	36 220	5 040	41 260	36 220	5 040	41 260
1992/93	10 160	2 410	12 570	39 080	5 220	44 300	39 080	5 220	44 300
1993/94	10 390	2 530	12 920	42 170	5 410	47 580	42 170	5 410	47 580
1994/95	10 640	2 640	13 280	45 500	5 600	51 100	45 500	5 600	51 100
1995/96	10 880	2 780	13 660	49 060	5 810	54 870	49 060	5 810	54 870
1996/97	11 150	2 890	14 040	52 890	6 040	58 930	52 890	6 040	58 930
1997/98	11 400	3 030	14 430	57 000	6 290	63 290	57 000	6 290	63 290
1998/99	11 670	3 160	14 830	61 390	6 570	67 960	61 390	6 570	67 960
1999/00	11 940	3 310	15 250	66 130	6 860	72 990	66 130	6 860	72 990
2000/01	12 210	3 460	15 670	71 220	7 160	78 380	71 220	7 160	78 380
2001/02	12 430	3 560	15 990	75 530	7 490	83 020	75 530	7 490	83 020
2002/03	12 640	3 660	16 300	80 120	7 810	87 930	80 120	7 810	87 930
2003/04	12 880	3 750	16 630	84 970	8 170	93 140	84 970	8 170	93 140

NOTE:

[a] BU = Billing Unit = 10^8 Joules

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PART ONE

ECONOMICS AND DEMOGRAPHICS

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PART ONE

ECONOMICS AND DEMOGRAPHICS

1.1 Introduction

The forecasts of economic and demographic variables provide the framework for the load forecast. The Long Term Economic Outlook (LTEO) prepared by the Corporate Economist in June, 1983 is the source of these forecasts. The LTEO presents a forecast of the United States economy, the Canadian economy and a detailed forecast of the B. C. economy. The pertinent aspects of those forecasts are reproduced here.

1.2 U.S. and Canadian Economic Outlook

TABLE 1-1 presents the key economic indicators for the U.S. and Canada. They are obtained from models of each economy using various exogenous assumptions.

For the U.S.,

- the outlook in the short-run is for gradual recovery in 1983, primarily caused by increased spending in housing and consumer durables, but partially offset by a deterioration in net exports due to a stronger U.S. dollar. Business investment is expected to recover after 1984 reflecting an increase in cash flow, corporate profits, higher utilization rates and consumption expenditures. Improvement in the trade balance, plus a strengthening of capital spending will contribute to real economic growth reaching 4.9% by 1984. In the longer term, U.S. real economic growth should average about 2.9%, compared with the 3.5% per year average economic growth experienced over the past twenty years;

- as the economy recovers, some rebound in inflation is likely, but the Consumer Price Index (CPI) is not expected to rise above 5.5% because of the moderating influence of existing excess capacity, softening oil prices, moderating wage pressures due to more realistic expectations, plus the continuing monetary restraint. In the longer term, CPI increases after 1990 are forecast to average 5% per year;

- competition for capital market funds between government and the private sector might emerge after 1984, but the Federal Reserve will likely permit money supply to grow just enough to satisfy credit demands, which could have some inflationary effects but little upward pressure on interest rates. In the longer term, gradually declining government deficits, reduced inflationary expectations, and a less volatile monetary policy should stabilize interest rates;

TABLE 1-1

KEY ECONOMIC INDICATORS

Economy	Economic Indicator	History		Forecast					
		1961 to 1981	1982	1983	1984	1985	1986	1987	1987 to 2000
United States	Economic Growth Real GNP (% Change)	3.5	-1.7	2.8	4.9	4.4	3.0	1.5	2.9
	Inflation CPI (% Change)	5.7	6.2	3.5	4.8	5.5	5.2	4.5	5.0
	Interest Rate 91-Day Treasury Bills	6.0	10.9	7.5	7.7	8.0	7.5	7.5	8.0
	Housing Starts[1]/Year (Millions)	1.56	1.1	1.6	1.8	2.0	2.1	1.8	1.73
Canada	Economic Growth Real GNP (% Change)	4.6	-4.8	2.4	5.3	4.3	3.5	2.0	3.1
	Inflation CPI (% Change)	5.9	10.8	6.4	5.5	6.0	6.0	5.0	5.5
	Interest Rate 90 Day Finance Company Paper	7.6	14.2	9.0	9.5	10.0	10.0	9.0	8.5
	Foreign Exchange U.S. ¢/Can. $	93.8	81.1	81.5	82.0	82.5	83.0	83.5	84.0

Source: Long Term Economic Outlook, 1983-2002; Corporate Economist, B. C. Hydro; June, 1983.

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- pent-up demand for housing currently exists, and with the projected decline in interest rates and further personal tax reductions, short-term steady improvement in housing starts is forecast. In the longer term, continuing demand, stable interest rates and prices should combine to maintain a satisfactory level of housing starts.

For Canada,

- economic growth in Canada is largely affected by economic developments occurring in the U.S. which is our major trading partner. After a weak recovery in 1983, total investment is expected to increase, world trade and consumer expenditures improve and Canadian real economic growth should climb to 5.3% real GNP growth in 1984, the peak of the next business cycle. In 1985 however, a less robust growth of 4.3% is anticipated due to moderating international trade and slightly higher interest and inflation rates. At the bottom of the next economic cycle in 1987, the Canadian economy is expected to show a 2.0% growth in real Gross National Product (GNP). In the long-term, real economic growth is expected to average slightly above 3.0% per year, which is lower than the 4.6% historical Canadian average but higher than the 2.9% average annual growth projected for the U.S. over the long-term;

- given lower U.S. inflation, lower interest rates and high unemployment rates, the easing of world oil prices, and public sector restraint programs, Canadian CPI inflation is forecast to fall to 6.4% in 1983 and to reach 5.0% in 1987. In the long-term it is expected that the rate of consumer price inflation will average 5.5%, slightly lower than the 5.9% average rate over 1961 to 1981. The GNP deflator will likely follow the same path as the CPI in both the short and long-term;

- the Bank of Canada is expected to narrow the spread between Canadian and U.S. interest rates rather than permit a significant appreciation of the Canadian dollar. The favourable merchandise trade account should help to provide some stability to the dollar in the short-run. Further, Canada's improved relative inflation performance, capital inflows and positive interest rate differentials are likely to keep the Canadian dollar trading between 81.5¢ and 84.0¢ U.S. in the longer term;

- short-term interest rates will likely bottom out in 1983. Weak demand for new short-term credit will exert downward pressure on interest rates, but the strenghtening economy will cause modest increases in 1985 and 1986 before stabilizing in the long term. Long-term interest rates are expected to decline in 1983 and stabilize thereafter. However, bond yields should remain relatively high compared to inflation given the concerns regarding a possible re-emergence of inflation together with large government deficits;

- the short-term outlook for housing starts is for modest recovery in 1983, followed by a stronger growth in 1984 through 1986 before a cyclical drop in 1987. Over 1988 to 2002, housing starts in Canada are forecast at 180,000 per year, slightly higher than the 1982 LTEO due to lower interest costs, and more stable prices which reflect the underlying demand for housing.

1.3 British Columbia Economic Outlook

In preparing the provincial forecast, significant efforts were made to identify growth prospects for the main sectors of the British Columbia economy. In particular, the forest, mining, retail (commercial) and energy sectors were the subject of individual research studies undertaken by private consultants on behalf of B. C. Hydro. In addition, an extensive survey of relevant publications, plus interviews with government and private sector experts provided information on capital investments, market developments, and technological and structural changes that might impact the future growth of B. C.'s industrial sectors. In preparing the sectoral forecasts, a comparison was done of the growth rates provided by the sources described above and those arrived at by simulating the provincial economy under a given set of assumptions for the U.S. and Canadian economies. These figures were then modified by applying a considerable amount of professional judgement to arrive at the final sectoral forecasts which, when aggregated, yielded the total GDP growth rates.

The recent recession took hold in B. C. during late 1981 and deepened through 1982, with substantial declines experienced in almost all sectors of the economy. Largely due to weak export markets and the resulting impact on the domestic economy, real economic growth in B. C. in 1982 fell by an estimated 7.0%. Only twice during the last thirty years has real B. C. GDP actually fallen, and that was by 0.3% in 1958 and 2.4% in 1975. TABLE 1-2 shows the key indicators for the B. C. economy.

Recovery is now underway, but despite a forecast of relatively strong U.S. housing starts of 1.6 million in 1983, B. C. is expected to achieve only a modest recovery of 1.8% real growth in GDP, reflecting the sluggishness of consumer expenditures and weak export markets for mining and pulp and paper. The outlook for the short-term is that B. C.'s economic activity will reflect improving conditions in both the U.S. and Canadian economies. GDP growth in B. C. will be substantial in 1984 to 1986 before a modest growth in 1987 at the bottom of a business cycle. In the long-term, B. C. GDP growth is projected to average 4.0% per year between 1988 and 1992, followed by a slightly lower 3.5% rate until the next century. B. C.'s economy is expected to become more diversified in the long-term, with expanded export markets and more emphasis on secondary manufacturing. Continued growth in the service sector is expected, but there will be relatively less energy investment in the province resulting from lower world crude oil price increases and reduced demand for energy.

B. C. sectoral growth for the probable GDP forecast is shown on TABLE 1-3. It shows that the forestry (including pulp and paper manufacturing) and mining activities will lead the economy out of recession. In the long-term, financial services, mining, transportation and community, business and personal service sectors will grow above the average GDP growth.

B. C. population growth is influenced by natural increases and by net migration patterns. A co-hort population model is used with fertility and mortality rates which reflect 1981 census data and generally accepted future trends. Continued net in-migration to B. C. is expected for a variety of reasons including employment opportunities and lifestyle changes. The result is a population growth of about 2.0% per year. TABLE 1-4 details the population forecast and the net-migration estimates.

By applying participation rates to various co-hort population groups, labour force estimates are derived. With female labour force participation rate increases expected to level out in the long term, labour force growth slows over the forecast period.

Although labour force growth will continue, the economic growth will not provide sufficient new jobs to substantially lower unemployment, and the unemployment rate will only gradually decline from present high levels. The same result is expected to occur in the whole Canadian economy.

B. C. housing starts in the short-term are expected to recover from the 1982 low and follow the general business cycle up and down to 1987. Thereafter, continuing modest increases in headship rates will cause household formation to require 33 to 36 thousand annual housing starts as shown on TABLE 1-2.

Total occupied dwellings are forecast from population and headship estimates, and are used as the basis for residential customer accounts. Occupied dwellings are different from housing stock by vacancies and individuals owning, but not occupying more than one dwelling. The split among types of dwelling is estimated by reviewing the historical dwelling preference of various population age groups and projecting these into the future. Using this methodology allows for differences in age group housing preferences to impact on the type and quantity of new dwellings. The results are shown in TABLE 1-4.

The result is that the single/duplex share of total occupied households declines over the forecast period, the row housing share increases, the apartment share increases slightly and the mobile share declines slightly.

These results are for total B. C. occupied dwellings. For load forecast purposes, these estimates are used to derive B. C. Hydro residential accounts which exclude dwellings not served by B. C. Hydro, but include dwellings such as seasonal homes. The methodology used to make this transition is discussed in Section Three.

TABLE 1-2

B. C. ECONOMY CENTRAL FORECAST SUMMARY

KEY INDICATORS

Indicator	Actuals		Forecast						
	1981	1982	1983	1984	1985	1986	1987	1987-1992	1992-2002
REAL GDP (Billions of 1971 $)	16.6[a]	15.4[b]	15.7	16.6	17.6	18.4	18.7	22.8[d]	32.2[d]
REAL GDP (% Change)	2.0	-7.0	1.8	5.8	6.0	4.5	2.0	4.0	3.5
GDP DEFLATOR (% Change)	10.9	10.5	6.5	6.5	7.0	7.3	6.5	6.5	6.5
CONSUMER PRICE INDEX - Vancouver (% Change)	14.3	10.5	6.2	6.0	6.5	6.5	5.5	6.0	6.0
HOUSING STARTS[c] (Thousands)	41.6	20	26	33	35	31	26	33	36
LABOUR FORCE (Thousands)	1,337	1,346	1,377	1,416	1,456	1,490	1,522	1,706[d]	2,186[d]
UNEMPLOYMENT RATE (%)	6.7	12.1	13.5	12.5	11.5	11.0	10.5	9.0	7.5

[a] Preliminary.

[b] Estimate.

[c] Excluding mobile homes.

[d] Value for the last year of the period shown.

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TABLE 1-3

B. C. CENTRAL GDP CASE SECTORAL GROWTH[a]

RESTRAINED RECOVERY

	Average 1961-1980 Share of Economy %	1982 Estimated Actual Value $ Millions	Real % Change in Value Added 1982	1983	1984	1985	1986	1987	1987-2002
Agriculture[b]	1.6	208	2.5	3.5	4.0	4.0	3.0	3.0	3.0
Construction	7.2	1,055	-5.0	1.0	3.5	8.0	4.0	3.0	3.0
Financial Services	12.3	1,608	-3.8	1.5	3.4	4.0	4.0	4.5	3.9
Forestry[b]	11.5	1,201	-16.0	8.0	22.0	16.0	10.0	-8.0	1.5
Manufacturing	7.7	1,076	-5.5	3.1	4.3	3.5	3.5	3.0	3.0
Mining[b]	5.0	455	-18.0	5.0	26.0	14.0	-5.0	2.0	5.8
Retail Trade[c]	13.0	1,766	-11.0	2.0	5.9	8.7	8.8	4.0	3.5
Transportation	11.1	1,728	-6.0	1.0	4.5	3.0	3.0	3.5	4.0
Utilities	3.4	512	-3.8	1.0	2.5	3.7	3.2	2.5	2.5
Community, Business & Personal Services	19.8	3,033	-5.8	1.0	2.1	3.2	4.0	4.5	4.8
Fisheries[b]	0.4	30	-12.0	0.0	2.0	2.0	3.5	2.0	1.0
Government	7.0	912	-2.0	-4.0	0.0	1.0	1.5	1.0	1.5
Total Gross Domestic Product	100.0	13,585	-7.0	1.8	5.8	6.0	4.5	2.0	3.7

[a] All figures in this table are based on estimates of the Gross Domestic Product at factor cost (value-added approach) whereas TABLE 1-2 contains figures on Gross Domestic Product at market prices.

[b] The percentage share of the economy for these primary industries combines primary activity and dependent or related manufacturing activity.

[c] Includes wholesale.

TABLE 1-4

SUMMARY OF B. C. KEY DEMOGRAPHIC VARIABLES

Year	Net-Migration	Population	Occupied Households					People Per Household	
			Total	Single/Duplex	Row	Apartment	Mobile	Average[a]	Margin[b]
			thousands						
1982	17	2 783	1 022	693	35	240	54	2.72	
1983	11	2 817	1 045	705	40	247	54	2.70	
1984	24	2 865	1 073	719	45	256	54	2.67	1.76 (1982-87)
1985	30.5	2 920	1 104	734	50	265	55	2.64	
1986	33	2 979	1 136	749	56	275	56	2.62	
1987	35	3 040	1 168	765	61	285	56	2.60	
1992	45	3 376	1 337	844	101	339	60	2.53	1.99 (1987-92)
2002	55	4 111	1 717	998	180	475	64	2.39	1.93 (1992-2002)

[a] Calculated by dividing total occupied households into population.

[b] Calculated by dividing the change in total occupied households into the change in population for a given period.

PART TWO

ENERGY PRICES

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PART TWO

ENERGY PRICES

2.1 Introduction

Price forecasts are prepared for electricity, natural gas and crude oil. This part of the report presents the basis of these forecasts and the resulting price trends.

2.2 Electricity Prices

B. C. Hydro's future electricity prices, i.e. rates based on revenue requirements, will be a function of its sunken costs in existing facilities, the load growth, the costs of new facilities to meet the load growth, the cost of financing these facilities, the interest coverage achieved over the forecast period and the level of taxes imposed on electricity sales.

The trend in future electricity prices is calculated using B. C. Hydro's financial model. The analysis starts with the existing and committed costs and incorporates projections of capital and operating costs. Whereas operating costs are charged through to the customer each year as incurred, the costs of capital facilities are recovered in the form of interest and depreciation over the lives of the facilities. For a given load forecast and system plan the model calculates the costs of production for each year of the forecast period and then the average percentage change in rates from one year to the next so that annual revenues equal annual costs.

The analyses presented here start with the September 1982 load forecast and the system plan issued in December based on that load forecast. In the course of preparing the 1983 load forecast it became evident that load growth would be somewhat lower than forecast in 1982. In addition to using the 1982 forecast growth rate of 4.3% between 1981/82 and 1992/93, analyses were also carried out with the load growing at 3.5 and 3.0% and with corresponding modifications to the system plan.[1] The principal generation components of the three system plans are shown in TABLE 2-1.

The annual rate increases required so that revenues cover costs were calculated for each of the three load forecasts and system plans assuming that:

- B. C. Hydro reaches an interest coverage of 1.3 by 1987/88;
- water taxes are indexed, i.e. it is assumed that the step increase in taxes, which was to have taken place in January 1984 but has been deferred, does not occur;

---

[1] The projected rate of load growth, as developed in this report, is 3.4% per annum from 1981/82 to 1992/93 and 2.9% per annum for the next ten years, i.e. very close to the 3.5% followed by 3.0% per annum on which the center column in TABLE 2-1 is based.

TABLE 2-1

GENERATION EXPANSION PLANS
1983/84 SYSTEM PLAN PROJECT SCHEDULE

Year	Load Growth of 4.3% per Year	Load Growth of 3.5% per Year	Load Growth of 3.0% per Year
1984	Revelstoke 1-4	Revelstoke 1-4	Revelstoke 1-4
1985	-	-	-
1986	-	-	-
1987	-	-	-
1988	-	-	-
1989	-	-	-
1990	-	-	-
1991	Peace Site C 1-5	-	-
1992	Peace Site C 6	-	-
	Keenleyside 1&2	-	-
1993	Keenleyside 3	Keenleyside 1&2	-
	Murphy Creek 1-3		
1994	Murphy Creek 4&5	Keenleyside 3	-
	More Creek	Peace Site C 1&2	-
1995	Iskut Canyon	Peace Site C 3-6	-
1996	-	-	Peace Site C 1-5
1997	Stikine Canyon	Murphy Creek 1-3	Peace Site C 6
1998	Stikine-Tanzilla	Murphy Creek 4&5	Keenleyside
		Iskut Canyon	
1999	-	More Creek	Murphy Creek
2000	Liard-Devil's Gorge	Stikine Canyon	Iskut Canyon
2001	-	-	-
2002	-	Stikine-Tanzilla	More Creek
2003	-	-	-

Notes:

a The Load Growth shown is from the 1981/82 base to 1992/93. The 4.3% growth represents the probable September 1982 forecast. Load growth after 1992/93 is projected to decline from 4.3% to 3.2%/year in the first case, from 3.5% to 3.0%/year in the second case and from 3.0% to 2.0%/year in the third case.

b The system plan for 3.0% load growth was developed by stretching out the schedule for 4.3% load growth. It does not necessarily represent the least cost sequence.

- the composite cost of new debt is 10.5%;

- the Canadian dollar increases gradually from the present level of 81¢ U.S. and averages 83.5¢ U.S. over the forecast period;

- there are modest export sales averaging $60 million per year in 1982 dollars; and

- all costs escalate at 5.5% per annum over the twenty year period.

Two additional analyses were prepared for the central load growth forecast holding all assumptions constant except for varying the inflation by one percentage point i.e. with inflation of 4.5% and 6.5%.

TABLE 2-2 presents the real price indexes resulting from each of these scenarios. In all cases rates will have to increase as B. C. Hydro simultaneously achieves 1.3 interest coverage and capitalizes the cost of the Revelstoke project. The actual configuration of these increases will be the subject of a series of hearings before the British Columbia Utilities Commission. It is not the purpose of this exercise to attempt to anticipate how those rate increases will take place.

In comparing the first three columns in TABLE 2-2 which show expected increases for various load growths and system plans it is observed that:

- the average price indexes in the ten year period 1984 to 1993 increase slightly from 1.11 to 1.13 as the rate of load growth declines. A large part of the costs are fixed in this period and higher sales reduce the unit costs; and

- in the 1994 to 2003 period higher growth and more rapid development of resources increase the unit costs.

The fourth and fifth column in TABLE 2-2 show the effect of higher or lower inflation. A large part of B. C. Hydro's costs are fixed in nominal terms in much the same way that a 20-year house mortgage is fixed. A higher forecast of inflation increases the deflator used to express future nominal dollars in constant dollars, and lowers the projection of cost in terms of constant dollars. As is seen, a change in the inflation of 2 percentage points, holding other variables constant, has a significant effect on the future prices in terms of constant dollars. The future level of inflation is considered to be the principal uncertainty in forecasting constant dollar electricity price increases.

Because of the range of uncertainties with respect to forecasting electricity prices no attempt has been made to project year to year fluctuations. Instead a single long-term level, 12% higher in real terms than 1982/83 levels, has been selected and it has been assumed

TABLE 2-2

INDEXES OF ELECTRICITY PRICES
- 1982 Dollars -

Fiscal	5.5% Inflation and Load Growth of: 4.3%/yr.	3.5%/yr.	3.0%/yr.	3.5%/yr. Load Growth and Inflation of: 4.5%	6.5%	Selected Index
1982/83	1.00	1.00	1.00	1.00	1.00	1.00
1983/84	1.00	1.00	1.00	1.01	1.00	1.00
1984/85	1.06	1.07	1.07	1.08	1.05	1.03
1985/86	1.11	1.13	1.14	1.16	1.11	1.06
1986/87	1.17	1.20	1.22	1.24	1.17	1.09
1987/88	1.22	1.28	1.30	1.32	1.23	1.12
1988/89	1.16	1.21	1.23	1.27	1.16	1.12
1989/90	1.10	1.15	1.17	1.21	1.09	1.12
1990/91	1.04	1.09	1.11	1.16	1.02	1.12
1991/92	1.09	1.03	1.05	1.11	0.98	1.12
1992/93	1.13	1.00	1.02	1.08	0.94	1.12
1993/94	1.15	0.97	0.99	1.05	0.91	1.12
1994/95	1.16	1.05	0.95	1.14	0.99	1.12
1995/96	1.17	1.09	0.91	1.19	1.03	1.12
1996/97	1.19	1.07	0.91	1.16	1.01	1.12
1997/98	1.19	1.09	0.98	1.18	1.03	1.12
1998/99	1.25	1.12	1.01	1.21	1.06	1.12
1999/00	1.26	1.15	1.04	1.24	1.09	1.12
2000/01	1.28	1.19	1.09	1.29	1.13	1.12
2001/02	1.37	1.18	1.11	1.28	1.12	1.12
2002/03	1.32	1.16	1.09	1.26	1.10	1.12
Average 1984-2003	1.17	1.11	1.07	1.18	1.06	1.11
1984-1993	1.11	1.12	1.13	1.16	1.08	1.09
1994-2003	1.23	1.11	1.01	1.20	1.05	1.12

that this level will be reached in four annual real increases of about 3% per year between 1983/84 and 1987/88. Using this approach electricity prices average 11% higher over the 20 year period from 1983/84 to 2002/03.[2]

2.3. Oil Prices

Future oil prices in British Columbia will be a function of world crude oil price trends and federal and provincial government pricing and taxation policies.

2.3.1 World Crude Oil Prices

The prolonged slowdown in world economic activity and major structural changes in energy consumption caused world crude oil prices to soften during 1982. World crude oil demand outside the centrally planned economies, which are largely self-sufficient, peaked at 7.8 million cubic meters per day (49 million b/d) in 1979 and dropped to about 7.1 million cubic meters per day (45 million b/d) in 1982. During the same period, crude oil production from non-OPEC sources continued to rise, and inventory drawdown increased substantially in 1982. OPEC crude oil production fell from 4.9 million cubic meters per day (30.9 million b/d) in 1979 to 2.9 million cubic meters per day (18.5 million b/d) in 1982.

The surplus of crude oil supply capacity caused many producing countries to decrease crude oil prices to maintain adequate levels of production and revenue. The downward pressure on crude oil prices caused a reduction in the official price of crude oil from OPEC members during the first quarter of 1983. At the same time, an agreement on production quotas among OPEC members was also reached. Except for Saudi Arabia, production quotas for the remaining OPEC members are 2 million cubic meters per day (12.5 million b/d) which is very similar to their actual production of 1.9 million cubic meters per day (12.1 million b/d) in 1982. Saudi Arabia, which produced an average of about 1 million cubic meters per day (6.5 million b/d) in 1982, has undertaken to be the swing OPEC producer and will meet the demand for OPEC crude in excess of 2 million cubic meters per day (12.5 million b/d) up to 2.8 million cubic meters per day (17.5 million b/d).

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[2] In many instances a utility's future electricity prices are influenced to a large degree by load growth. This is true for B. C. Hydro but over the first ten years, as has been noted, the average price is similar for the three load growths examined. Thus the dilemma that sometimes faces forecasters of price being a function of load growth and load growth in turn being a function of price, and the resulting difficulty of arriving at a price forecast and load forecast that are consistent, has been minor in this exercise. In the course of preparing the price forecast the incorporation of the changing outlook for interest rates and inflation has had greater impact on prices than variations in load growth.

Future world crude oil prices are subject to considerable debate. For B. C. Hydro's base case projection, it is assumed that some continued softness in the world market causes a modest drop in Saudi Arabian marker crude oil price in 1984. Thereafter real price increase of zero to 1 percent over U.S. inflation of about 5 percent per year are projected.

Specifically, Saudi Arabian marker crude oil price in nominal dollars is forecast to average U.S. $182 per m^3 (U.S. $29/b) for 1983 and U.S. $176 per m^3 (U.S. $28/b) for 1984 before rising to U.S. $240 per m^3 (U.S. $38/b) in 1990 and U.S. $430 per m^3 (U.S. $69/b) in 2000. In real 1982 U.S. dollars, terms the price would be U.S. $26 and U.S. $29 per barrel in 1990 and 2000, respectively.

The Saudi marker price is adjusted for quality and transporation charges to derive an average price of imported crude oil landed in Montreal. This price forms the basis for calculating the Canadian blended crude oil price.

2.3.2 Vancouver Blended Crude Oil and Crude Oil Product Prices

The Vancouver crude oil price reflects the world crude oil price and Canadian pricing policies. The relatively low world crude oil prices during the initial years of the forecast period cause the current price for old Canadian crude oil (C $185/$m^3$ or C $29.50/b) to exceed 75 percent of the world crude oil price ceiling set out in the 1981 Energy Pricing and Taxation Agreement (EPTA) between the Alberta and Federal governments. The base case B. C. Hydro forecast does not rollback the old oil price to achieve the 75 percent ratio; rather, the old oil price is held at the current level until world oil prices rise enough to re-establish the 75 percent ratio and then the old oil price rises accordingly. Using this assumption, the Vancouver blended crude oil price is the sum of:

- the current wellhead price of old oil;
- the pipeline tariffs to Vancouver;
- the Petroleum Compensation Charge (PCC) which provides funds to pay for new or imported crude oil at prices above the old oil price;
- a Canadian Ownership Special Charge (COSC) which is to be extended indefinitely as proposed in the Federal Budget of 19 April, 1983.

The resulting blended Vancouver crude oil price in nominal terms remains stable at C $214/$m^3$ (C $34/b) during 1983 and 1984, and then rises modestly as world crude oil prices rise, reaching C $290/$m^3$ (C $46/b) and C $560/$m^3$ (C $89/b) in 1990 and 2000, respectively.

Oil product prices are developed based on the Vancouver blended crude price and are presented in the Long Term Economic Outlook.

2.4 Natural Gas Prices

Natural gas prices are a function of production and transmission costs and government policies which determine the level of taxes.

At present gas prices in B. C. are based on the B. C. Utilities Commission pricing method which bases the production, or field price, on a given net back to producers. The B. C. Hydro selling price is the sum of:

- B. C. wholesale natural gas price;
- B. C. Hydro cost of service;
- B. C. Hydro system losses;
- a Natural Gas and Gas Liquids Tax (NGGLT);
- a Canadian Ownership Special Charge (COSC); and
- a municipal/sales tax (if applicable).

The only link with oil prices is the level of the NGGLT levied by the federal government.

In April 1983, the B. C. Ministry of Energy, Mines and Petroleum Resources (MEMPR) published a Technical Report on natural gas supply to Vancouver Island. In this report, the B. C. wholesale pricing mechanism is changed to become directly linked to crude oil prices. Specifically, the report sets the B. C. wholesale price equal to the Alberta Border Price (ABP) in 1986, and then increases the wholesale price to achieve a heat parity ratio of 65 percent of the Vancouver blended crude oil price in 1990 and thereafter. This pricing mechanism establishes a direct link between natural gas and crude oil prices, and is similar to the Eastern Canadian natural gas pricing method.

In the case of the BCUC pricing method, the B. C. Hydro average selling price in 1992 would be lower in real terms than the 1982 value, and then rise in real terms between 1992 and 2000. The Vancouver 65 pricing method results in a real price increase of some 17% between 1983 and 1992 and another 4% by 2003/04. As discussed in the two previous sections, electricity prices in real terms would be 12% higher in 1992 than in 1982 and crude oil product prices would have no real increase over the same period.

The B. C. government has not made an official policy statement regarding Vancouver 65 natural gas pricing but does have a long standing policy to ensure natural gas is encouraged as the preferred fuel.

For long term load forecast purposes, it is assumed that the B. C. government's policy to encourage natural gas use will remain. To maintain its current competitive position it is assumed that B. C. Hydro's average natural gas selling price increases at the same rate as the B. C. Hydro average electricity selling price. This results in a 12 percent increase in real natural gas prices as shown in TABLE 2-3.

2.5 Comparison of Price Trends

The energy price forecasts developed in the previous sections are summarized in TABLE 2-3 in terms of the B. C. Hydro average selling prices for electricity and natural gas and the blended price of crude oil in Vancouver. As has been discussed, electricity and natural gas prices are forecast to increase by 12% between 1983/84 and 87/88 and then remain constant over the remainder of the period.

The prices shown in TABLE 2-3 are average selling prices and do not represent the prices energy consumers will pay for a given electricity or gas service or an oil product. The actual selling price for electricity and gas depend on the rate category the customer is in. As this exercise does not assume any rate structure changes, the future electricity and gas prices for a given rate should be determined by ratioing the future average price change to the existing 1982/83 rate.

TABLE 2-3

HISTORIC AND FORECAST
ELECTRICITY, NATURAL GAS AND CRUDE OIL PRICES
(1982 Dollars)

	B. C. Hydro Average Selling Price			Vancouver Blended Crude Oil Price	
	Electricity		Natural Gas		
	¢/kW.h	$/GJ	$/GJ	$/GJ	$/bbl
Actual					
1971/72	3.45	9.58	2.15	1.35	8.27
1976/77	3.33	9.25	2.29	2.56	15.66
1981/82	3.42	9.50	3.60	5.11	31.28
1982/83	3.75	10.42	3.85	5.59	34.21
Forecast					
1983/84	3.75	10.42	3.85	5.38	32.93
1984/85	3.86	10.72	3.97	5.01	30.65
1985/86	3.98	11.06	4.08	4.93	30.20
1986/87	4.09	11.36	4.20	4.76	29.11
1987/88	4.20	11.67	4.31	4.75	29.07
1988/89	4.20	11.67	4.31	4.68	28.67
1989/90	4.20	11.67	4.31	4.65	28.46
1990/91	4.20	11.67	4.31	4.75	29.04
1991/92	4.20	11.67	4.31	4.79	29.29
1992/93	4.20	11.67	4.31	4.85	29.68
1993/94	4.20	11.67	4.31	4.89	29.92
2003/04	4.20	11.67	4.31	5.09	31.18

Conversion factors: Electricity 277.8 kW.h = 1 GJ
Crude Oil .1634 barrel = 1 GJ

PART THREE

ELECTRIC-PROBABLE RESIDENTIAL SALES

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PART THREE

ELECTRIC-PROBABLE RESIDENTIAL SALES

3.1 Introduction

In the fiscal year ending March 1983, B. C. Hydro's residential sales amounted to 8 821 GW.h and comprised 31.3% of total sales. B. C. Hydro served an average of some 957 200 residential customers, of which 15.4% had electric space heating. The average annual use for non-electric heating customers was 8 127 kW.h in 1982/83, and for those with electric heating the annual use was 15 211 kW.h per customer.

The average number of residential accounts increased by some 27 400 over last year indicating a growth of almost 3%. This was coupled with a modest 0.8% decline in average use resulting from a milder than normal winter. Under average weather conditions the use would have been in the order of 9 365 kW.h or 0.8% higher than last year. Sales increased by 181 GW.h or 2.1% and would have increased by 324 GW.h or 3.8% on a weather corrected basis.

Continued growth in residential accounts and sales will be heavily dependent upon household formation and the trend in the installation of electricity for space heating. Conservation and the consumer's response to prices will also affect future sales.

3.2 Household Formation and B. C. Hydro Accounts

As projected in Part One, households in B. C. will grow at 2.7% per year over the 1982 to 1993 period and at 2.5% per year over the 1993 to 2003 period. B. C. Hydro accounts will grow at the same rate since the relationship between provincial households and B. C. Hydro accounts is expected to remain constant. Hydro's 1982/83 fiscal year average number of residential accounts of 957 200 will thereby increase to 1 283 800 by 1993/94 and to 1 644 600 by 2003/04. B. C. Hydro serves approximately 91% of all provincial residential electrical accounts directly, the balance being served by WKP&L in their service area and by New Westminster which is served by B. C. Hydro as one inter-utility account.

The housing mix derived in Part One and applied to B. C. Hydro accounts has the following effect:

	% Dwelling Type	
	1982/83	1993/94
Single/Double	64.3	60.0
Row	3.1	6.5
Apartment	23.0	24.9
Mobile	5.4	4.5
Seasonal/Misc.	4.2	4.1

3.3 Electric Space Heating Accounts

The use of electricity for space heating continues to play an important role in the determination of residential load growth. In 1982/83 the percentage of new households that installed electric heat exceeded 50%. With energy prices continuing to rise, future capture rates will be very susceptible to relative fuel costs as well as to gas availability and public acceptance of electric space heating.

As can be seen in TABLE 3-1, historic capture rates have not responded precisely to either relative fuel costs or to gas availability. To some extent capture rates have been influenced by builders who have demonstrated a distinct preference for electric space heating, especially in row and apartment dwellings. For the builder electric heat means a capital cost savings of $500 to $1500 per dwelling unit. However he must be sure that he gains acceptance from the purchaser/renter who will face higher operating costs using electricity.

For 1983/84 the capture rates by dwelling type were judgementally selected considering the historic data. Other forecast year capture rates were calculated by applying the gas availability and cost ratios to the 1983/84 numbers. As noted on TABLE 3-1 the gas to electric cost ratios are based on fuel price projections in TABLE 2-3, and include the assumption that gas furnace efficiencies will further improve from an average of 65% to an average of 75% by 1993/94.

For Vancouver Island, it is assumed that gas will be available in 1986/87 and that capture rates for electric heating will remain close to 100% until then. Thereafter, it is assumed that approximately 70% of the electric service area will receive gas and will move towards the provincial average capture rate while the remainder will continue with electric capture rates near 100%.

The resulting net average annual capture rate between 1982/83 and 1993/94 is 42% for all B. C. Hydro and 36% excluding Vancouver Island.

3.4 Average Use Trends

The electricity consumption in a household is a function of the numbers and types of appliances and of their efficiency and level of use. Starting with an initial load profile, TABLE 3-2, based on B. C. Hydro load data and appliance stock information from the Residential Survey, projections of changing stock and use patterns are developed and combined in a computational model with housing information to derive long term use patterns. Conservation and price effects are considered for each appliance.

New types of appliances are now being introduced at a slower rate and many existing types are nearing saturation. This will result in reduced growth in number of appliances compared with historic levels. However most appliances will need to be replaced within the period of the forecast and this will allow new, more efficient stock to influence the load growth. TABLE 3-3 details the appliance life and saturation projections.

Reductions in use levels for appliances, lighting, and water heaters will be significant over the forecast period and are the result of three prominent factors:

- rising energy prices throughout North America will cause manufacturers to continue to produce more efficient appliances;
- B. C. consumers will, in response to higher electricity prices, select more efficient appliances or find less energy intensive alternatives; and
- higher electricity prices will encourage consumers to curtail consumption by using certain appliances less frequently.

The estimated reductions in annual electricity consumption for each appliance over the forecast period are given in TABLE 3-3. These values are developed from Conservation Impact Studies that are based on long-term electricity price increases of 1% per year for both B. C. and North America. This is consistent with the price projections given in this forecast. An analysis of the sensitivity of the conservation to prices is given in Appendix A. It is important to note that the reduced use levels projected in TABLE 3-3 apply to the new stock being added in that year. The weighted average use of any appliance in any year will depend upon the cumulation of existing stock.

The combined savings for lighting and appliances including electric water heaters is estimated to be 900 GW.h by 1993/94 and 1 820 GW.h by 2003/04. Of this 730 GW.h in 1993/94 and 1 530 GW.h in 2003/04 can be attributed to improvements over today's efficiency standards.

Consumption for electric space heating will contine to decline in response to insulation and weatherization improvements. A detailed impact analysis report is available from the Conservation Division. As well, dwelling sizes may be reduced in the future and with a shift to row and apartment dwellings the average square footage for homes will be significantly lower.

The estimated savings for electric heating are 300 GW.h by 1993/94 of which 100 GW.h can be attributed to further improvements over today's average home construction standards. By 2003/04 the savings will be 830 GW.h of which 470 GW.h relate to future improvements.

3.5 Residential Summary

Residential sales are expected to rise from 8 821 GW.h in 1982/83 to 11 606 GW.h by 1993/94. This represents an average annual growth rate of 2.5%. Average annual accounts will increase from 957 200 in 1982/83 to 1 283 800 in 1993/94, an annual growth rate of 2.7%. The effect of the projected capture rates is that electric accounts will increase as a proportion of total accounts from 15.4% in 1982/83 to 22.1% by 1993/94. Year by year account and use level details are presented in TABLE 3-4. TABLE 3-5 lists further detail by non-heating and heating categories and shows 11 years history for total B. C. Hydro. TABLES 3-6 through 3-10 provide similar data by Divisions.

TABLE 3-1

CAPTURE RATES FOR RESIDENTIAL ELECTRIC SPACE HEATING

Fiscal Year	Gas[a] Availability	Gas to Electric[b] Cost Ratio	Capture Rate for Electric Space Heating[c] Single	Row	Apt
Historic					
1978/79	.71	.69	.22	.71	.67
79/80	.76	.73	.12	.49	.47
80/81	.79	.78	.12	.69	.44
81/82	.76	.82	.22	.59	.60
82/83	.81	.78	.20	.78	.63
Forecast					
1983/84	.80	.77	.20	.65	.55
1988/89	.82	.72	.18	.59	.50
1993/94	.84	.67	.17	.54	.46

[a] The percentage of new accounts that have natural gas available to them. Historic based on Commerical Activity Report. All figures exclude Vancouver Island.

[b] Relative costs are for a 1 200 sq. ft. single family home in the Lower Mainland. Consumption estimates are based on Energy Use Engineering information. Fuel prices are based on incremental residential electric rates and on average gas rates. In the forecast it is estimated that average furnace efficiencies will improve from 65% in 1982/83 to 75% in 1993/94.

[c] Capture rates exclude Vancouver Island. Historic based on Commercial Activity Report. 1983/84 forecast figures selected by Load Forecast. Other forecast years derived by applying changing gas availability and cost ratios to 1983/84 projections.

TABLE 3-2

RESIDENTIAL ELECTRIC
LOAD PROFILE
1982/83

	Average Use (kW.h)	Saturation (%)	Use Per Account (kW.h)	Accounts (000's)	Sales (GW.h)
Appliances					
1. Range	1 200	90	1 080		
2. Microwave	240	10	24		
3. Refrigerator	1 440	100	1 440		
4. Freezer	1 440	50	720		
5. Washer	60	75	45		
6. Dryer	900	65	585		
7. Dishwasher	360	40	144		
8. Blockheater	200	15	30		
9. Other	1 043	100	1 043		
Sub-total			5 111	957.2	4 892
Lighting	1 000	100	1 000	957.2	957
Water Heating	4 200	48	2 016	957.2	1 930
Total use per Non Electric Heating account			8 127	957.2	7 779
Space Heating			7 084	147.1	1 042
Total use per Electric Heating account			15 211		
Total Residential			9 216	957.2	8 821

TABLE 3-3

RESIDENTIAL ELECTRIC APPLIANCE FORECAST

APPLIANCE	Average Life Span (Years)	Annual Consumption[b] 1982/83 (kWh)	Annual Consumption[b] 2003/04 (kWh)	Average Market Saturation 1982/83 %	Average Market Saturation 2003/04 %
1. RANGE	12	1 150	900	90	95
2. MICROWAVE	10	240	170	10	60
3. FRIDGE	15	1 390	1 080	100	110
4. FREEZER	20	1 375	900	50	60
5. WASHER	11	60	50	75	85
6. DRYER	14	900	750	65	75
7. DISHWASHER	11	350	200	40	60
8. BLOCKHEATER	20	200	150	15	15
9. OTHER[a]	10	950	1 900	100	100
LIGHTING	10	1 000	600	100	100
WATER HEATER	8	4 000	2 800	48	48

[a] 'Other' includes televisions, small appliances, waterbeds, hot tubs, etc.

[b] These are the estimated average annual consumption levels for a new appliance in a particular year based on the current housing mix and assuming gradually increasing electricity prices in North America combined with the B. C. electricity price forecast given in TABLE 2-3.

TABLE 3-4

RESIDENTIAL ELECTRIC SALES PROJECTIONS
(Billed basis, no adjustment for accrual)

Year	Average Residential Accounts (000)	Percent Electric Heating (%)	Annual Average Use Per Account: Non Electric Heating (kW.h)	Electric Heating (kW.h)	All Accounts (kW.h)	Total of Sales (GW.h)
1981/82 (Actual)	929.8	14.2	8 129	16 320	9 292	8 640
1982/83 (Actual)	957.2	15.4	8 127	15 211	9 216	8 821
Av. Ann. Growth: %						
10 Yrs: 72/73-82/83	4.0	-	2.0	-2.2	2.4	6.4
1983/84	979.3	16.3	8 120	15 920	9 390	9 196
1984/85	1 005.3	17.2	8 115	15 655	9 410	9 461
1985/86	1 034.2	18.1	8 110	15 390	9 425	9 748
1986/87	1 063.9	18.7	8 085	15 115	9 400	10 002
1987/88	1 093.8	19.3	8 065	14 860	9 375	10 255
1988/89	1 124.7	19.9	8 030	14 615	9 340	10 506
1989/90	1 156.2	20.4	7 990	14 380	9 295	10 746
1990/91	1 188.1	20.9	7 940	14 145	9 235	10 972
1991/92	1 219.6	21.3	7 880	13 920	9 170	11 183
1992/93	1 251.5	21.7	7 820	13 700	9 100	11 387
1993/94	1 283.8	22.1	7 770	13 505	9 040	11 606
2003/04	1 644.6	25.3	7 755	12 315	8 810	14 649
Av. Ann. Growth: %						
11 Yrs: 82/83-93/94	2.7	-	-0.4	-1.1	-0.2	2.5
10 Yr 93/94-03/04	2.5	-	-0.0	-0.9	-0.3	2.4

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B.C. HYDRO

TABLE 3-5

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
TOTAL HYDRO

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			AV.HTG
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	ACCTS. % /TOT
HISTORIC												
1972/73	615,072	32,230	6,658	4,095	33,944	3,893	18,972	644	649,016	7,302	4,739	5.2
1973/74	647,539	32,467	6,940	4,494	36,228	2,284	18,825	682	683,767	7,570	5,176	5.3
1974/75	677,509	29,970	7,260	4,919	39,976	3,748	19,161	766	717,485	7,924	5,685	5.6
1975/76	700,510	23,001	7,599	5,323	46,305	6,329	20,192	935	746,815	8,380	6,258	6.2
1976/77	724,473	23,963	7,588	5,497	58,205	11,900	19,380	1,128	782,678	8,465	6,625	7.4
1977/78	747,462	22,989	7,659	5,725	67,801	9,596	19,556	1,326	815,263	8,649	7,051	8.3
1978/79	761,860	14,398	7,710	5,874	85,534	17,733	18,922	1,618	847,394	8,841	7,492	10.1
1979/80	767,929	6,069	7,802	5,992	103,092	17,558	16,835	1,735	871,021	8,871	7,727	11.8
1980/81	782,371	14,442	7,888	6,171	117,640	14,548	15,907	1,871	900,011	8,935	8,042	13.1
1981/82	797,660	15,289	8,129	6,484	132,110	14,470	16,320	2,156	929,770	9,292	8,640	14.2
1982/83	810,099	12,439	8,127	6,584	147,086	14,976	15,211	2,237	957,185	9,216	8,821	15.4
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.8		2.0	4.9	15.8		-2.2	13.3	4.0	2.4	6.4	
PROJECTIONS												
1983/84	820,180	10,081	8,123	6,663	159,110	12,024	15,922	2,533	979,290	9,390	9,196	16.3
1984/85	832,910	12,730	8,118	6,762	172,400	13,290	15,657	2,699	1,005,310	9,411	9,461	17.2
1985/86	847,560	14,650	8,112	6,875	186,630	14,230	15,392	2,873	1,034,190	9,426	9,748	18.1
1986/87	865,180	17,620	8,088	6,998	198,780	12,150	15,113	3,004	1,063,960	9,401	10,002	18.7
1987/88	882,790	17,610	8,064	7,119	211,050	12,270	14,860	3,136	1,093,840	9,376	10,255	19.3
1988/89	901,340	18,550	8,033	7,240	223,410	12,360	14,618	3,266	1,124,750	9,341	10,506	19.9
1989/90	920,480	19,140	7,992	7,356	235,730	12,320	14,380	3,390	1,156,210	9,294	10,746	20.4
1990/91	940,030	19,550	7,939	7,463	248,010	12,280	14,148	3,509	1,188,040	9,235	10,972	20.9
1991/92	959,530	19,500	7,881	7,562	260,070	12,060	13,922	3,621	1,219,600	9,169	11,183	21.3
1992/93	979,450	19,920	7,821	7,660	272,040	11,970	13,700	3,727	1,251,490	9,099	11,387	21.7
1993/94	999,680	20,230	7,771	7,769	284,080	12,040	13,508	3,837	1,283,760	9,041	11,606	22.1
2003/04	1,228,590	24,830	7,755	9,526	415,960	14,110	12,315	5,123	1,644,550	8,810	14,649	25.3
AVG. ANNUAL GROWTH % 11 YEARS 82/83-93/94	1.9		-0.4	1.5	6.2		-1.1	5.0	2.7	-0.2	2.5	
10 YEARS 93/94-03/04	2.1		-0.0	2.1	3.9		-0.9	2.9	2.5	-0.3	2.4	

B.C. HYDRO

TABLE 3-6

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
LOWER MAINLAND

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			AV.HTG
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	ACCTS. % /TOT
HISTORIC												
1972/73	374,888	15,814	6,165	2,311	9,267	1,159	17,805	165	384,155	6,446	2,476	2.4
1973/74	390,391	15,503	6,401	2,499	9,345	78	17,442	163	399,736	6,659	2,662	2.3
1974/75	404,638	14,247	6,648	2,690	9,940	595	17,907	178	414,578	6,918	2,868	2.4
1975/76	417,043	12,405	6,973	2,908	11,052	1,112	18,820	208	428,095	7,279	3,116	2.6
1976/77	429,894	12,851	6,998	3,009	14,302	3,250	18,198	260	444,196	7,359	3,269	3.2
1977/78	444,160	14,266	7,045	3,129	16,993	2,691	18,532	315	461,153	7,468	3,444	3.7
1978/79	454,229	10,069	7,135	3,241	24,172	7,179	17,244	416	478,401	7,645	3,657	5.1
1979/80	458,364	4,135	7,286	3,340	31,981	7,809	15,175	485	490,345	7,801	3,825	6.5
1980/81	469,089	10,725	7,385	3,464	36,154	4,173	14,650	530	505,243	7,904	3,994	7.2
1981/82	477,383	8,294	7,615	3,635	40,409	4,255	15,163	613	517,792	8,203	4,248	7.8
1982/83	486,212	8,829	7,562	3,677	46,535	6,126	14,011	652	532,747	8,125	4,329	8.7
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.6		2.1	4.8	17.5		-2.4	14.7	3.3	2.3	5.7	
PROJECTIONS												
1983/84	493,200	6,988	7,565	3,730	51,700	5,165	14,920	772	544,900	8,263	4,502	9.5
1984/85	501,600	8,400	7,560	3,792	57,590	5,890	14,640	843	559,190	8,289	4,635	10.3
1985/86	510,420	8,820	7,550	3,854	63,730	6,140	14,365	915	574,150	8,306	4,769	11.1
1986/87	519,520	9,100	7,540	3,917	70,010	6,280	14,115	988	589,530	8,321	4,905	11.9
1987/88	528,730	9,210	7,530	3,981	76,180	6,170	13,890	1,058	604,910	8,331	5,039	12.6
1988/89	538,380	9,650	7,510	4,044	82,360	6,180	13,715	1,129	620,740	8,334	5,173	13.3
1989/90	548,300	9,920	7,485	4,104	88,510	6,150	13,505	1,195	636,810	8,322	5,299	13.9
1990/91	558,370	10,070	7,450	4,159	94,630	6,120	13,320	1,260	653,000	8,299	5,419	14.5
1991/92	568,360	9,990	7,400	4,208	100,620	5,990	13,150	1,323	668,980	8,268	5,531	15.0
1992/93	578,510	10,150	7,360	4,257	106,560	5,940	12,930	1,378	685,070	8,225	5,635	15.6
1993/94	588,790	10,280	7,320	4,310	112,490	5,930	12,775	1,437	701,280	8,196	5,747	16.0
AVG. ANNUAL GROWTH % 11 YEARS 82/83-93/94	1.8		-0.3	1.5	8.4		-0.8	7.4	2.5	0.1	2.6	

B.C. HYDRO

TABLE 3-7

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
CENTRAL INTERIOR

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	AV.HTG ACCTS. % /TOT
HISTORIC												
1972/73	43,648	3,985	7,606	332	3,641	117	21,697	79	47,289	8,691	411	7.7
1973/74	47,810	4,162	7,969	381	4,011	370	21,690	87	51,821	9,031	468	7.7
1974/75	51,516	3,706	8,444	435	4,205	194	21,403	90	55,721	9,422	525	7.5
1975/76	54,356	2,840	8,720	474	4,422	217	22,162	98	58,778	9,732	572	7.5
1976/77	57,134	2,778	8,454	483	5,581	1,159	21,502	120	62,715	9,615	603	8.9
1977/78	59,805	2,671	8,862	530	5,816	235	22,868	133	65,621	10,103	663	8.9
1978/79	61,781	1,976	8,900	550	6,988	1,172	22,582	158	68,769	10,290	708	10.2
1979/80	63,777	1,996	8,903	568	7,845	857	19,762	155	71,622	10,092	723	11.0
1980/81	66,612	2,835	8,785	585	8,681	836	18,278	159	75,293	9,879	744	11.5
1981/82	69,278	2,666	8,941	620	9,488	807	18,303	173	78,766	10,068	793	12.0
1982/83	70,197	919	9,154	642	10,333	845	16,788	174	80,530	10,134	816	12.8
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	4.9		1.9	6.8	11.0		-2.5	8.2	5.5	1.5	7.1	
PROJECTIONS												
1983/84	71,550	1,353	9,150	655	11,040	707	17,660	195	82,590	10,288	850	13.4
1984/85	73,410	1,860	9,150	672	11,740	700	17,220	202	85,150	10,263	874	13.8
1985/86	75,470	2,060	9,150	690	12,400	660	16,835	209	87,870	10,234	899	14.1
1986/87	77,620	2,150	9,150	710	13,070	670	16,475	216	90,690	10,206	926	14.4
1987/88	79,820	2,200	9,150	731	13,720	650	16,140	221	93,540	10,175	952	14.7
1988/89	82,140	2,320	9,140	751	14,370	650	15,820	227	96,510	10,135	978	14.9
1989/90	84,540	2,400	9,120	771	15,000	630	15,515	233	99,540	10,084	1,004	15.1
1990/91	87,010	2,470	9,090	791	15,620	620	15,215	238	102,630	10,022	1,029	15.2
1991/92	89,480	2,470	9,060	811	16,230	610	14,905	241	105,710	9,956	1,052	15.4
1992/93	92,020	2,540	9,020	830	16,830	600	14,650	247	108,850	9,890	1,077	15.5
1993/94	94,580	2,560	8,995	851	17,460	630	14,400	251	112,040	9,837	1,102	15.6
AVG. ANNUAL GROWTH % 11 YEARS 82/83-93/94	2.7		-0.2	2.6	4.9		-1.4	3.4	3.0	-0.3	2.8	

B.C. HYDRO

TABLE 3-8

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
NORTH COAST

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			AV.HTG
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	ACCTS. % /TOT
HISTORIC												
1972/73	15,851	330	8,769	139	2,860	491	24,126	69	18,711	11,116	208	15.3
1973/74	16,389	538	9,275	152	3,055	195	24,877	76	19,444	11,726	228	15.7
1974/75	17,021	632	9,753	166	3,335	280	23,088	77	20,356	11,938	243	16.4
1975/76	17,553	532	10,198	179	3,720	385	23,656	88	21,273	12,551	267	17.5
1976/77	18,119	566	9,879	179	4,278	558	21,973	94	22,397	12,189	273	19.1
1977/78	18,351	232	10,027	184	4,462	184	23,532	105	22,813	12,668	289	19.6
1978/79	18,359	8	9,944	183	4,961	499	22,594	112	23,320	12,634	295	21.3
1979/80	18,826	467	9,773	184	5,200	239	20,959	109	24,026	12,194	293	21.6
1980/81	19,462	636	9,886	192	5,802	602	19,103	111	25,264	12,003	303	23.0
1981/82	20,243	781	10,168	206	6,357	555	19,161	122	26,600	12,317	328	23.9
1982/83	20,629	386	10,317	213	6,797	440	18,115	123	27,426	12,250	336	24.8
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.7		1.6	4.4	9.0		-2.8	6.0	3.9	1.0	4.9	
PROJECTIONS												
1983/84	21,060	431	10,315	218	6,920	123	18,835	130	27,980	12,422	348	24.7
1984/85	21,510	450	10,310	221	7,130	210	18,615	133	28,640	12,378	354	24.9
1985/86	22,180	670	10,310	229	7,410	280	18,360	136	29,590	12,326	365	25.0
1986/87	22,860	680	10,310	236	7,700	290	18,115	139	30,560	12,277	375	25.2
1987/88	23,550	690	10,310	243	7,990	290	17,880	143	31,540	12,228	386	25.3
1988/89	24,260	710	10,300	250	8,300	310	17,645	146	32,560	12,172	396	25.5
1989/90	24,980	720	10,275	257	8,620	320	17,415	150	33,600	12,107	407	25.7
1990/91	25,710	730	10,240	263	8,950	330	17,175	154	34,660	12,031	417	25.8
1991/92	26,430	720	10,195	270	9,290	340	16,945	157	35,720	11,951	427	26.0
1992/93	27,160	730	10,145	276	9,640	350	16,720	161	36,800	11,867	437	26.2
1993/94	27,890	730	10,110	282	9,990	350	16,510	165	37,880	11,798	447	26.4
AVG. ANNUAL GROWTH % 11 YEARS 82/83-93/94	2.8		-0.2	2.6	3.6		-0.8	2.7	3.0	-0.3	2.6	

B.C. HYDRO

TABLE 3-9

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
SOUTH INTERIOR

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			AV.HTG
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	ACCTS. % /TOT
HISTORIC												
1972/73	60,293	6,959	7,032	424	6,313	797	18,850	119	66,606	8,152	543	9.5
1973/74	65,850	5,557	7,320	482	6,918	605	17,924	124	72,768	8,328	606	9.5
1974/75	70,996	5,146	7,817	555	7,878	960	18,406	145	78,874	8,875	700	10.0
1975/76	74,543	3,547	8,130	606	9,290	1,412	19,591	182	83,833	9,400	788	11.1
1976/77	77,535	2,992	8,087	627	11,408	2,118	19,197	219	88,943	9,512	846	12.8
1977/78	80,112	2,577	8,251	661	13,026	1,618	19,807	258	93,138	9,867	919	14.0
1978/79	81,613	1,501	8,350	681	15,535	2,509	20,142	313	97,148	10,236	994	16.0
1979/80	82,626	1,013	8,224	680	17,499	1,964	17,229	301	100,125	9,798	981	17.5
1980/81	84,450	1,824	8,306	702	18,926	1,427	16,213	306	103,376	9,753	1,008	18.3
1981/82	88,060	3,610	8,528	751	20,047	1,121	16,497	331	108,107	10,005	1,082	18.5
1982/83	90,438	2,378	8,734	790	21,690	1,643	16,029	347	112,128	10,145	1,137	19.3
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	4.1		2.2	6.4	13.1		-1.6	11.3	5.3	2.2	7.7	
PROJECTIONS												
1983/84	92,330	1,892	8,725	806	22,870	1,180	17,010	389	115,200	10,370	1,195	19.9
1984/85	94,570	2,240	8,715	824	23,980	1,110	16,865	405	118,550	10,364	1,229	20.2
1985/86	97,280	2,710	8,700	846	25,360	1,380	16,665	423	122,640	10,347	1,269	20.7
1986/87	100,070	2,790	8,690	870	26,810	1,450	16,475	441	126,880	10,335	1,311	21.1
1987/88	102,890	2,820	8,680	893	28,270	1,460	16,295	461	131,160	10,321	1,354	21.6
1988/89	105,850	2,960	8,660	917	29,780	1,510	16,115	480	135,630	10,297	1,397	22.0
1989/90	108,870	3,020	8,630	940	31,320	1,540	15,935	499	140,190	10,262	1,439	22.3
1990/91	111,950	3,080	8,590	962	32,890	1,570	15,750	518	144,840	10,216	1,480	22.7
1991/92	115,020	3,070	8,550	984	34,470	1,580	15,560	536	149,490	10,170	1,520	23.1
1992/93	118,140	3,120	8,510	1,006	36,060	1,590	15,380	554	154,200	10,117	1,560	23.4
1993/94	121,320	3,180	8,480	1,029	37,690	1,630	15,230	574	159,010	10,084	1,603	23.7
AVG. ANNUAL GROWTH % 11 YEARS 82/83-93/94	2.7		-0.3	2.4	5.2		-0.5	4.7	3.2	-0.1	3.2	

B.C. HYDRO

TABLE 3-10

RESIDENTIAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
VANCOUVER ISLAND

	NON ELECTRIC HEATING				ELECTRIC HEATING				TOTAL			AV.HTG
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)	ACCTS. X /TOT
HISTORIC												
1972/73	120,392	5,142	7,384	889	11,863	1,329	17,871	212	132,255	8,325	1,101	9.0
1973/74	127,099	6,707	7,711	980	12,899	1,036	17,986	232	139,998	8,657	1,212	9.2
1974/75	133,338	6,239	8,047	1,073	14,618	1,719	18,881	276	147,956	9,118	1,349	9.9
1975/76	137,015	3,677	8,437	1,156	17,821	3,203	20,145	359	154,836	9,785	1,515	11.5
1976/77	141,791	4,776	8,456	1,199	22,636	4,815	19,217	435	164,427	9,938	1,634	13.8
1977/78	145,034	3,243	8,419	1,221	27,504	4,868	18,725	515	172,538	10,062	1,736	15.9
1978/79	145,878	844	8,357	1,219	33,678	6,374	18,268	619	179,756	10,224	1,838	18.8
1979/80	144,336	-1,542	8,454	1,220	40,567	6,689	16,879	685	184,903	10,302	1,905	21.9
1980/81	142,758	-1,578	8,600	1,228	48,077	7,510	15,918	765	190,835	10,443	1,993	25.2
1981/82	142,696	-62	8,917	1,272	55,809	7,732	16,435	917	198,505	11,030	2,189	28.1
1982/83	142,623	-73	8,847	1,262	61,731	5,922	15,244	941	204,354	10,779	2,203	30.2
AVG. ANNUAL GROWTH (X) 10 YEARS 72/73-82/83	1.7		1.8	3.6	17.9		-1.6	16.1	4.4	2.6	7.2	
PROJECTIONS												
1983/84	142,040	-583	8,835	1,254	66,580	4,849	15,728	1,047	208,628	11,029	2,301	31.9
1984/85	141,820	-220	8,835	1,253	71,960	5,380	15,510	1,116	213,780	11,082	2,369	33.7
1985/86	142,210	390	8,830	1,256	77,730	5,770	15,310	1,190	219,940	11,120	2,446	35.3
1986/87	145,110	2,900	8,715	1,265	81,190	3,460	15,030	1,220	226,300	10,981	2,485	35.9
1987/88	147,800	2,690	8,600	1,271	84,890	3,700	14,765	1,253	232,690	10,849	2,524	36.5
1988/89	150,710	2,910	8,480	1,278	88,600	3,710	14,580	1,284	239,310	10,707	2,562	37.0
1989/90	153,790	3,080	8,345	1,284	92,280	3,680	14,235	1,313	246,070	10,554	2,597	37.5
1990/91	156,990	3,200	8,200	1,288	95,920	3,640	13,970	1,339	252,910	10,388	2,627	37.9
1991/92	160,240	3,250	8,040	1,289	99,460	3,540	13,720	1,364	259,700	10,214	2,653	38.3
1992/93	163,620	3,380	7,890	1,291	102,950	3,490	13,480	1,387	266,570	10,046	2,678	38.6
1993/94	167,100	3,480	7,760	1,297	106,450	3,500	13,250	1,410	273,550	9,895	2,707	38.9
AVG. ANNUAL GROWTH X 11 YEARS 82/83-93/94	1.5		-1.2	0.3	5.1		-1.3	3.7	2.7	-0.8	1.9	

PART FOUR

ELECTRIC - PROBABLE GENERAL SALES

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PART FOUR

ELECTRIC-PROBABLE GENERAL SALES

4.1 Introduction

The General Sales category comprises a mixture of sales to small industries and commercial establishments. The sales in this category for the year ending March 1983 were 9 704 GW.h.

Over the past year, analysis has continued to break down the total load in this sector into Standard Industrial Classification (SIC) accounts. Slightly over 90% of the 1982/83 load has been classified on a preliminary basis, as indicated in TABLE 4-1, but no comparable classification is yet available of the load in previous years. As the table headings indicate, the first five categories are primarily industrial or industrial related, and the remaining seven are commercial activities. Continued classification indicates most unclassified loads are commercial. The industrial and commercial sectors are discussed separately.

4.2 Small Industrial

Most of B. C. Hydro's industrial sales are served under the Transmission Rate but there are a substantial number of small industrial customers classified under General sales, comprising 28% of General sales in 1982/83.

As historical data by SIC codes are not yet available, detailed analysis of the growth of each component of industrial load relative to economic growth is not possible. In the absence of this, the loads for the industrial components are forecast to grow at the same rate as the economic activity that most closely corresponds to that load. The load classifications, the economic activity selected as the basis for forecasting the load and the resulting electricity forecasts are shown on TABLE 4-2.

The wood and other manufacturing sales are the largest components of the general industrial category. The wood manufacturing forecast is based on the Woodbridge, Reed and Associates Study with some modifications made by B. C. Hydro. See the Transmission Rate section on wood manufacturing for discussion.

The other manufacturing sales in TABLE 4-2 are forecast by combining them with the Transmission Rate sales for crude oil refining, cement manufacturing and other non-metallic mineral processing, and increasing the total by the manufacturing component of GDP contained in the Long-Term Economic Outlook (LTEO). Major manufacturing activity such as pulp and paper and wood are not included in B. C. Hydro's estimate of manufacturing GDP. The forecast of total manufacturing sales is reduced by specific estimates of Transmission Rate loads and the residual is classified as other manufacturing in the General category.

TABLE 4-1

DISAGGREGATION OF SALES[a] BY SIC ACCOUNT

		Distribution of Load 1982/83 GW.h
SMALL INDUSTRIAL		
1.	Agriculture, Forestry, Fishing, Trapping, Mines (incl. Milling) and Quarries	200
2.	Paper and Allied Products	152
3.	Chemical and Chemical Products	78
4.	Wood Manufacturing	1 246
5.	Other Manufacturing	1 004
	SUB-TOTAL	2 680
COMMERCIAL AND INSTITUTIONAL		
6.	Construction	180
7.	Transportation, Communication and other Utilities	889
8.	Wholesale and Retail Trade	1 387
9.	Finance, Insurance and Real Estate	1 177
10.	Community, Business and Personal Svcs.	2 081
11.	Public Administration and Defence	430
	SUB-TOTAL	6 144
12.	Unclassified	1 254
	TOTAL	10 078[b]

[a] Sales included on this table are the total of B. C. Hydro's General plus Irrigation plus Street Lighting plus Own Use Categories, i.e. all sales categorized by the Industrial Consumption Analysis (ICA) system less B. C. Hydro's Transmission Rate category sales.

[b] The 10 078 GW.h includes 9 704 GW.h General, 47 GW.h Irrigation, 228 GW.h Street Lighting and 99 GW.h B. C. Hydro Own Use.

Note:

Sales on this TABLE 4-1 cannot be compared directly to those on TABLES 4-4 through 4-7 for the following reasons:

- classified sales on TABLE 4-1 are those actually coded at time of preparation of the load forecast, i.e. no adjustments are made;
- sales on TABLES 4-4 through 4-7 are adjusted to remove Irrigation, Street Lighting and B. C. Hydro Own Use sales; and
- sales on TABLES 4-4 through 4-7 are further adjusted to estimate classification of some unclassified load, e.g. retail and office.

TABLE 4-2
GENERAL-INDUSTRIAL ELECTRIC ENERGY REQUIREMENTS
GW.h

	Agriculture	Forestry	Fishing & Trapping	Mines (including Milling), Quarries[a]	Chemicals & Chemical Products[b]	Paper & Allied[c]	Wood Manufacturing[d]	Other Manufacturing[e]	Total
Forecast By:	Agriculture Sector GDP	Forestry Sector GDP	Fishing Sector GDP	Copper Production Growth	Other Manufacturing Sector GDP	Pulp Production	Forest Sector Study	Other Manufacturing Sector GDP	
Year									
1982/83 (actual)	29	32	18	121	78	152	1 246	1 004	2 680
1983/84	30	35	18	126	80	115	1 344	1 021	2 769
1984/85	31	42	18	131	84	125	1 511	1 065	3 001
1985/86	32	49	19	137	87	135	1 621	1 096	3 176
1986/87	33	54	19	143	90	135	1 680	1 142	3 296
1987/88	34	50	20	149	93	135	1 700	1 182	3 363
1988/89	35	51	20	155	95	137	1 700	1 224	3 417
1989/90	37	52	20	161	98	139	1 700	1 267	3 474
1990/91	38	53	20	168	101	141	1 702	1 317	3 540
1991/92	39	54	21	175	104	144	1 713	1 364	3 614
1992/93	40	55	21	183	107	147	1 725	1 412	3 690
1993/94	41	56	21	190	111	150	1 800	1 462	3 831
2003/04	55	65	23	255	149	183	1 826	2 096	4 652

[a] Small remaining mining load not in Transmission Rate. In 1982/83, production curtailments caused some loads to move indefinitely from Transmission Rate to General category.
[b] Remaining load after Transmission Rate sales removed.
[c] The 1982/83 value appears high due to an unexplained high reading for one month thus the forecast starting point is based on previous years values.
[d] Based on forest sector study by Woodbridge, Reed with modifications by the Load Forecast Department.
[e] Residual after forecasting combined (Transmission Rate plus General) other manufacturing sales and removing Transmission Rate sales.

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4.3 Commercial Electric Energy Requirements

4.3.1 Introduction

A study[1] by Currie, Coopers & Lybrand (CC&L) of floorspace for retail, food service, office and accommodation activity was undertaken for the 1983 Load Forecast to provide base year estimates of floorspace and linkages between various components of economic growth and floorspace growth. This work is combined with additional analysis of unit floorspace electricity use to forecast electric energy requirements. Combining the new floorspace work with the floorspace work done in 1982 results in 60% of the commercial category being forecast by floorspace analysis. The remainder of the commercial category is forecast by relating it to sectoral GDP, population and conservation estimates. The detailed methodology of estimating commercial electric energy requirements and the method of forecasting the growth in floorspace for the various categories of commercial activity are discussed below.

4.3.2 Electricity Use in Commercial Buildings

Studies by Energy Use Engineering (EUE) indicate the electricity use rate per unit of floorspace ($kW.h/m^2$) varies between old and new floorspace. The studies, most of which were completed in 1979/80, predicted substantial electricity conservation in lighting over the 20 year forecast period, with major gains in the period to 1985. The conservation in non-lighting loads was expected to be modest.

Recent EUE survey data for the 1977/78 to 1981/82 fiscal period indicate that the electricity use rates in commercial buildings have tended to remain unchanged and have not shown the decline predicted by earlier EUE studies. Discussions with lighting industry representatives indicate that marketing of new flourescent lighting systems has only now become a major factor and that lighting in existing stock will change to more efficient units in the future. Use of more efficient lighting, such as metal-halide lamps is not expected to become widespread in B. C. unless electricity prices increase substantially. Even in eastern North America, where electricity prices are often twice those in B. C., these new lighting sources are not now in widespread use.

Discussions with EUE personnel have been held to review the electricity conservation used in the 1983 Load Forecast. The rate of implementation of energy saving technology is a key factor which involves a substantial level of judgement. The electricity use rates shown on TABLE 4-3 are used in the 1983 Load Forecast. EUE are expected to update their previous studies in the near future and these will be used to review the estimated use rates.

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[1] Currie, Coopers & Lybrand Ltd., The Commercial Sector in B. C., Its Growth and Space Requirements to 2002, April 19, 1983.

4.3.3 Retail

The base year (1982/83) floorspace estimate for retail sales (including food stores) used in the Load Forecast is based on the CC&L estimate of total B. C. retail space inventory for 1981. The estimate is for gross leaseable area which would not include common areas such as mall hallways. To arrive at a total 1982/83 estimate served by B. C. Hydro the CC&L estimate was adjusted for base year stock, a ratio of total to gross leaseable floorspace (1.07) and B. C. Hydro's share of total provincial space (93% as per population).

For future retail floorspace estimates, the ratios for retail sales to GDP, and retail sales to floorspace as developed by CC&L are combined with B. C. Hydro's GDP forecast.[2] Where difficulties arose in the short term by using this method, small adjustments were made to make B. C. Hydro's economic variables the key inputs.

A computer model using the methodology described above has been developed by B. C. Hydro. Total floorspace, for retail trade and for the other types of use discussed below, is calculated for each year of the forecast period. The stock of floorspace in the first year is demolished at 1% per year and the stock of new floorspace is equal to total floorspace less the remaining portion of 1982 stock.

Using this approach retail floorspace is estimated to grow at less than GDP growth, and when combined with the use rates in TABLE 4-3 (a weighted combination of the Retail plus Food Stores use rates shown on the Table) result in the retail electric energy requirements shown on TABLE 4-4.

4.3.4 Food Services (Restaurants/Cafes):

The CC&L study estimated that food service floorspace approximates about 10% of retail space. Due to data difficulties this estimate is tentative and could vary if better data becomes available. Using B. C. Hydro's SIC code sales and use rate data, food service floorspace was estimated to represent 11.3% of space for retail trade. This latter figure based on B. C. Hydro data is used in the analysis.

The unit electricity use rate for food service accounts varies considerably, but an average value of 500 kW.h/m^2 in 1982/83 is adopted. The use rate for existing floorspace is forecast to decrease less than in new floorspace where more efficient lighting can be installed at the outset.

The combination of floorspace and electric use rate shown on TABLE 4-3 provides an estimate of electric energy requirements for the food services sector as shown on TABLE 4-4. Electricity sales are forecast to grow from 383 GW.h in 1982/83, to 467 GW.h in 1993/94 and 592 GW.h in 2003/04.

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[2] For the purposes of preparing and testing their models, CC&L developed forecasts of GDP and other economic variables. The estimation of these variables was a secondary exercise for CC&L, with the understanding that B. C. Hydro's estimates would be used for the load forecast.

4.3.5 Office

The CC&L study develops office floorspace estimates for several sectors - Finance, Insurance and Real Estate; Business Services; Government; Industries and Utilities. The electric energy requirements for offices for each of these sectors is removed from the respective total sector requirements and forecast independently.

The CC&L study relates estimates of office space (from various planning and municipal sources) to office employees. The ratio of floorspace per employee is established for 1982 on the basis of CC&L survey data and then adjusted in the near term to reflect the over building that has occurred. In the longer term, the ratio returns to what CC&L expect to be a stable value of 16.8 m^2/employee.

Office floorspace requirements are forecast using the same ratio of GDP to office employees as the CC&L study, and virtually the same ratio of floorspace per employee. The resulting floorspace growth is similar to GDP growth. The estimate of floorspace served by B. C. Hydro is made by increasing the CC&L estimate by 7% to derive total as distinct from gross leaseable floorspace, and then reducing the resulting provincial total floorspace to 97.9% to identify the space estimated to be served by B. C. Hydro (the remainder being in the WKP&L service area).

Combining the floorspace and electric use rate projections shown on TABLE 4-3 provides a forecast of office electricity requirements as shown on TABLE 4-4. From 1 081 GW.h in 1982/83, these requirements increase to 1 798 GW.h in 1993/94 and 2 606 GW.h in 2003/04. These values are lower than the actual model output due to an estimate of B. C. Hydro's own office building use being removed and classified in B. C. Hydro own use.

4.3.6 Accommodation

The CC&L study estimates floorspace for hotel and motel accommodation, but it states that the floorspace per hotel or motel unit is not clear and subject to wide estimates. The Ministry of Energy, Mines and Petroleum Resources (MEMPR) made a forecast of accommodation floorspace in 1981 and it is higher than the CC&L estimate. The derived floorspace estimate obtained by dividing use rate into the total SIC electricity consumption as detailed in B. C. Hydro's data is also higher than the CC&L estimate. In fact, the MEMPR and B. C. Hydro floorspace estimates are very close and are adopted as the basis for forecasting future floorspace.

The 1983 accommodation floorspace is increased by the same ratio to GDP growth as in the CC&L study. Combining the floorspace and electric use rate projections shown on TABLE 4-3 provides a forecast of accommodation electricity requirements as shown on TABLE 4-4. From 397 GW.h in 1982/83, electricity requirements rise to 546 GW.h in 1993/94 and 688 GW.h in 2003/04.

4.3.7 Health and Education Facilities

For the 1982 Load Forecast, floorspace estimates for health and education facilities were developed and used for forecasting electricity requirements. Details of the floorspace computer models are described in the 1982 Load Forecast. With modest changes in the electric energy use rate to reflect more recent data, the models, which are based on components of the population forecast, are used to estimate 1983 electricity requirements.

In addition, not all the electricity consumed in health and education facilities identified by SIC codes is explained by the floorspace model. Specifically, nursing home use and certain education facilities are not included in the floorspace model, but their electricity requirements are estimated by relating to appropriate portions of the model. The floorspace model does explain 80 to 85% of the electricity requirements for these sectors which are shown on TABLE 4-5.

4.3.8 Remaining General Commercial

Several classifications of General commercial activity are identified by SIC codes and forecast separately. Because there is no history of electricity sales by SIC codes yet available, the forecasts for these loads are based on several factors.

The load classifications, size and forecast variables are shown on TABLE 4-6.

4.4 Total General Electric Energy Requirements

Summing the components of the General Category results in growth in electric energy requirements from 9 704 GW.h in 1982/83 to 13 151 GW.h in 1993/94 and 17 110 GW.h in 2003/04. Complete results and projection of the unclassified sales are shown on TABLE 4-7. Details for accounts and sales in the 'Under 35 kW' and '35 kW and Over' rate categories are presented both in total and by division on TABLES 4-8 through 4-13.

TABLE 4-3

COMMERCIAL FLOORSPACE ELECTRICITY USE RATES
kW.h/m² for Old (New) Floorspace

Category	Year	Use Rates Used in Preparation of the 1983 Load Forecast			
		Lighting[b]	Motors	Miscellaneous	Total
Retail[a]	1982	107	88	-	195
	1985	102(86)	85(84)	-	187(170)
	1995	86(70)	84(82)	-	170(152)
	2005	75(60)	84(80)	-	159(140)
Food Stores[a]	1982	143	385	22	550
	1985	136(114)	373(370)	22	531(506)
	1995	114(93)	370(358)	22	506(473)
	2005	100(79)	366(350)	22	488(451)
Food Services (Restaurants/Cafes)	1982	175	175	150	500
	1985	166(140)	170(168)	150	486(458)
	1995	140(114)	168(163)	150	458(427)
	2005	123(96)	166(159)	150	439(405)
Office	1982	135	98	12	245
	1985	128(108)	95(94)	50(60)	273(262)
	1995	108(88)	94(91)	90(100)	292(279)
	2005	95(74)	93(89)	120(130)	308(293)
Accommodation	1982	38	75	37	150
	1985	36(30)	73(72)	37	146(139)
	1995	30(25)	72(70)	37	139(132)
	2005	27(21)	71(68)	37	135(126)

[a] Retail and Food Stores are combined to represent total retail sales category for doing the actual load projections.

[b] Represents reductions in lighting use of 5% (20%), 20% (35%), 30% (45%) in 1985, 1995 and 2005, respectively.

TABLE 4-4

ELECTRIC ENERGY REQUIREMENTS FOR RETAIL,
OFFICE, ACCOMMODATION AND FOOD SERVICE FLOORSPACE
GW.h

Year	Retail[a]	Office	Accommodation	Food Service	Total
1982/83	1 663	1 081	397	383	3 524
1983/84	1 689	1 173	404	393	3 659
1984/85	1 697	1 247	424	397	3 765
1985/86	1 761	1 327	446	413	3 947
1986/87	1 791	1 373	461	421	4 046
1987/88	1 821	1 406	469	430	4 126
1988/89	1 840	1 466	482	435	4 223
1989/90	1 859	1 528	496	441	4 324
1990/91	1 878	1 590	507	447	4 422
1991/92	1 896	1 659	520	453	4 528
1992/93	1 914	1 728	531	459	4 632
1993/94	1 941	1 798	546	467	4 752
2003/04	2 425	2 606	688	592	6 311

[a] Retail includes Food Stores.

TABLE 4-5

ELECTRIC ENERGY REQUIREMENTS FOR
EDUCATION AND HEALTH AND WELFARE FACILITIES
GW.h

	Education				Health and Welfare				
Year	Elementary & Secondary	Post Secondary[a]	Remainder	Sub-Total	Hospitals	Nursing Homes	Remainder	Sub-Total	Total
1982/83	339	137	25	501	202	77	9	288	789
1983/84	334	143	25	502	205	80	9	294	796
1984/85	335	148	25	508	209	82	10	301	809
1985/86	338	147	25	510	214	85	10	309	819
1986/87	343	146	26	515	219	88	10	317	832
1987/88	345	145	26	516	224	91	10	325	841
1988/89	347	149	26	522	230	95	11	336	858
1989/90	351	149	27	527	235	98	11	344	871
1990/91	357	154	27	538	241	101	11	353	891
1991/92	364	152	28	544	247	105	12	364	908
1992/93	372	155	28	555	253	109	12	374	929
1993/94	383	152	29	564	260	112	12	384	948
2003/04	473	191	36	700	324	145	15	484	1 184

[a] Without UBC which is served at Transmission Rate.

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TABLE 4-6

ELECTRIC ENERGY REQUIREMENTS
FOR REMAINING GENERAL COMMERCIAL
GW.h

	Construction	Transportation	Storage[a]	Communication & Utilities[b]	Wholesale Trade	Other Government[c]	Religious Organizations	Amusement & Recreation[d]	Common Areas in Apartments	Trailer Parks	Total
Forecast By:	Construction Sector GDP	Transportation Sector GDP	Residual	Utilities Sector GDP	Retail Sales Trend	Government Sector GDP	Population Growth	1.1 x Community Business & Personal Services Sector GDP	Apartment Growth	Mobile Home Growth	
Year:											
1982/83	180	366	145	278	335	160	41	246	184	11	1 946
1983/84	182	370	134	281	340	160	41	249	190	11	1 958
1984/85	188	386	124	288	342	160	42	254	197	12	1 993
1985/86	203	398	127	298	355	162	43	263	204	12	2 065
1986/87	211	410	129	308	361	164	44	275	211	13	2 126
1987/88	218	424	130	316	367	166	45	289	219	13	2 187
1988/89	224	441	132	324	371	168	46	304	226	14	2 250
1989/90	231	459	133	332	374	171	47	320	234	14	2 315
1990/91	238	477	135	340	378	173	47	337	242	14	2 381
1991/92	245	496	137	348	382	176	48	355	251	15	2 453
1992/93	252	516	139	357	386	178	49	374	260	16	2 527
1993/94	260	537	141	366	391	181	50	394	269	16	2 605
2003/04	349	795	172	469	488	210	61	660	379	23	3 606

[a] Total Storage is reduced by Transmission Rate load to determine the General sales (see Transmission Rate section for discussion of Storage).
[b] Excludes office building sales and B. C. Hydro own use.
[c] Excludes office building sales and street lighting.
[d] Grows at more than GDP to reflect anticipated increase in income and leisure time.

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TABLE 4-7

SUMMARY OF
GENERAL ELECTRIC ENERGY REQUIREMENTS
GW.h

	Small Industrial	Commercial		
		Classified	Unclassified[a]	Total
1981/82 (Actual)	2 710	5 295	1 701	9 706
1982/83 (Actual)	2 680	6 259	765	9 704
Av. Ann. Growth: %				
10 Yrs: 72/73-82/83	n/a	n/a	n/a	5.5
1983/84	2 769	6 413	784	9 966
1984/85	3 007	6 567	803	10 377
1985/86	3 176	6 831	835	10 842
1986/87	3 296	7 004	856	11 156
1987/88	3 363	7 154	874	11 391
1988/89	3 417	7 331	896	11 644
1989/90	3 474	7 510	918	11 902
1990/91	3 540	7 694	940	12 174
1991/92	3 614	7 888	964	12 466
1992/93	3 690	8 088	989	12 767
1993/94	3 831	8 305	1 015	13 151
2003/04	4 652	11 101	1 357	17 110
Av. Ann. Growth: %				
11 Yrs: 82/83-93/94	3.3	2.6	2.6	2.8
Av. Ann. Growth: %				
10 Yrs: 93/94-03/04	2.0	2.9	2.9	2.7

[a] Classification carried out over the past year indicates that most remaining unclassified general load consists of small commercial accounts. The unclassified is thus assigned to commercial and grown at the same rate as the classified commercial.

B.C. HYDRO

TABLE 4-8

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
TOTAL HYDRO

	UNDER 35 KV.				35 KV. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	91,645	4,387	16,869	1,546	6,116	-154	4,113	97,761	57,886	5,659
1973/74	95,614	3,969	17,843	1,706	6,025	-91	4,672	101,639	62,752	6,378
1974/75	99,380	3,766	18,555	1,844	6,452	427	4,841	105,832	63,166	6,685
1975/76	103,938	4,558	19,098	1,985	6,990	538	5,077	110,928	63,663	7,062
1976/77	108,598	4,660	18,610	2,021	7,808	818	5,571	116,406	65,220	7,592
1977/78	110,243	1,645	19,058	2,101	8,654	846	5,972	118,897	67,899	8,073
1978/79	112,384	2,141	19,211	2,159	9,442	788	6,353	121,826	69,870	8,512
1979/80	113,792	1,408	19,448	2,213	10,436	994	6,736	124,228	72,037	8,949
1980/81	115,089	1,297	19,342	2,226	11,822	1,386	7,118	126,911	73,627	9,344
1981/82	116,397	1,308	20,000	2,328	12,894	1,072	7,378	129,291	75,070	9,706
1982/83	117,617	1,220	19,572	2,301	14,071	1,177	7,403	131,688	73,689	9,704
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.5		1.5	4.1	8.7		6.1	3.0	2.4	5.5
PROJECTIONS										
1983/84	118,550	933	19,603	2,324	14,730	659	7,642	133,280	74,774	9,966
1984/85	119,900	1,350	19,650	2,356	15,345	615	8,021	135,245	76,726	10,377
1985/86	121,540	1,640	19,705	2,395	16,170	825	8,447	137,710	78,730	10,842
1986/87	123,470	1,930	19,762	2,440	16,930	760	8,716	140,400	79,489	11,156
1987/88	125,490	2,020	19,858	2,492	17,715	785	8,899	143,205	79,543	11,391
1988/89	127,610	2,120	19,959	2,547	18,535	820	9,097	146,145	79,674	11,644
1989/90	129,840	2,230	20,079	2,607	19,375	840	9,295	149,215	79,764	11,902
1990/91	132,160	2,320	20,150	2,663	20,225	850	9,511	152,385	79,898	12,174
1991/92	134,555	2,395	20,274	2,728	21,090	865	9,738	155,645	80,092	12,466
1992/93	137,020	2,465	20,399	2,795	21,980	890	9,972	159,000	80,296	12,767
1993/94	139,560	2,540	20,515	2,863	22,890	910	10,288	162,450	80,925	13,151
2003/04	165,530	2,680	21,675	3,588	32,030	960	13,522	197,560	86,607	17,110
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	1.6		0.4	2.0	4.5		3.0	1.9	0.9	2.8
10 YEARS 93/94-03/04	1.7		0.6	2.3	3.4		2.8	2.0	0.7	2.7

B.C. HYDRO

TABLE 4-9

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
LOWER MAINLAND

	UNDER 35 KV.				35 KV. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	52,096	1,775	16,968	884	3,225	7	2,521	55,323	61,548	3,405
1973/74	53,765	1,667	17,762	955	3,368	143	2,833	57,133	66,301	3,788
1974/75	55,552	1,787	17,746	1,027	3,611	243	2,944	59,163	66,424	3,971
1975/76	57,873	2,321	18,882	1,091	3,907	296	3,028	61,780	78,751	4,119
1976/77	60,137	2,264	18,225	1,096	4,362	455	3,297	64,499	68,110	4,393
1977/78	61,154	1,017	18,489	1,127	4,751	389	3,496	65,905	70,147	4,623
1978/79	61,970	816	18,593	1,153	5,118	367	3,705	67,088	72,401	4,858
1979/80	62,514	544	18,989	1,187	5,599	481	3,908	68,113	74,802	5,095
1980/81	63,142	626	18,992	1,199	6,263	664	4,131	69,405	76,798	5,330
1981/82	63,484	312	19,840	1,259	6,774	511	4,364	70,228	80,067	5,623
1982/83	64,273	819	19,514	1,254	7,373	599	4,290	71,646	77,363	5,544
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.1		1.4	3.6	8.6		5.5	2.6	2.3	5.0
PROJECTIONS										
1983/84	64,640	367	19,460	1,258	7,710	337	4,386	72,350	78,808	5,644
1984/85	65,150	510	19,490	1,270	8,005	295	4,597	73,155	80,195	5,867
1985/86	65,925	775	19,530	1,288	8,410	405	4,827	74,335	82,261	6,115
1986/87	66,805	960	19,580	1,310	8,790	380	4,981	75,675	83,131	6,291
1987/88	67,860	975	19,660	1,334	9,180	390	5,067	77,040	83,095	6,401
1988/89	68,850	990	19,760	1,360	9,585	405	5,166	78,435	83,213	6,526
1989/90	69,860	1,010	19,860	1,387	9,995	410	5,267	79,855	83,336	6,654
1990/91	70,885	1,025	19,870	1,408	10,405	410	5,370	81,290	83,387	6,778
1991/92	71,925	1,040	19,970	1,436	10,815	410	5,494	82,740	83,761	6,930
1992/93	72,990	1,065	20,070	1,465	11,230	415	5,593	84,220	83,798	7,058
1993/94	74,080	1,090	20,170	1,494	11,650	420	5,767	85,730	84,695	7,261
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	1.3		0.3	1.6	4.2		2.7	1.6	0.8	2.5

B.C. HYDRO

TABLE 4-10

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
CENTRAL INTERIOR

	UNDER 35 KV.				35 KV. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	7,506	410	18,519	139	799	-16	491	8,305	75,858	630
1973/74	8,075	569	19,938	161	724	-75	552	8,799	81,032	713
1974/75	8,456	381	20,577	174	776	52	591	9,232	82,864	765
1975/76	8,772	316	20,862	183	826	50	678	9,598	89,706	861
1976/77	9,155	383	20,644	189	834	8	736	9,989	92,601	925
1977/78	9,275	120	21,887	203	901	67	809	10,176	99,450	1,012
1978/79	9,741	466	22,112	215	1,002	101	861	10,743	100,195	1,076
1979/80	10,125	384	21,631	219	1,137	135	926	11,262	101,671	1,145
1980/81	10,409	284	21,897	228	1,289	152	978	11,698	103,088	1,206
1981/82	10,664	255	22,022	235	1,383	94	954	12,047	98,709	1,189
1982/83	10,707	43	21,038	225	1,514	131	990	12,221	99,440	1,215
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	3.6		1.3	4.9	6.6		7.3	3.9	2.7	6.8
PROJECTIONS										
1983/84	10,830	123	21,500	233	1,590	76	1,046	12,420	102,971	1,279
1984/85	11,020	190	21,700	239	1,660	70	1,099	12,680	105,525	1,338
1985/86	11,205	185	21,900	245	1,755	95	1,160	12,960	108,445	1,405
1986/87	11,420	215	22,100	252	1,845	90	1,199	13,265	109,433	1,451
1987/88	11,640	220	22,300	260	1,940	95	1,232	13,580	109,829	1,492
1988/89	11,880	240	22,500	267	2,040	100	1,265	13,920	110,065	1,532
1989/90	12,145	265	22,700	276	2,140	100	1,299	14,285	110,233	1,575
1990/91	12,415	270	22,900	284	2,240	100	1,337	14,655	110,651	1,621
1991/92	12,690	275	23,100	293	2,340	100	1,371	15,030	110,737	1,664
1992/93	12,970	280	23,300	302	2,440	100	1,410	15,410	111,130	1,712
1993/94	13,255	285	23,500	311	2,545	105	1,453	15,800	111,689	1,764
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	2.0		1.0	3.0	4.8		3.6	2.4	1.1	3.4

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
NORTH COAST

	UNDER 35 KM.				35 KM. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	3,246	110	18,484	60	304	-29	120	3,550	50,704	180
1973/74	3,435	189	19,505	67	256	-48	152	3,691	59,333	219
1974/75	3,563	128	20,208	72	259	3	151	3,822	58,347	223
1975/76	3,739	176	21,396	80	283	24	155	4,022	58,429	235
1976/77	3,909	170	20,210	79	321	38	183	4,230	61,939	262
1977/78	3,998	89	21,011	84	333	12	202	4,331	66,036	286
1978/79	4,141	143	21,383	88	345	12	222	4,486	69,226	310
1979/80	4,211	70	21,611	91	381	36	245	4,592	73,172	336
1980/81	4,295	84	21,184	91	438	54	262	4,730	74,627	353
1981/82	4,413	118	21,368	94	486	51	247	4,899	69,667	341
1982/83	4,442	29	20,452	91	543	57	247	4,985	67,773	338
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	3.2		1.0	4.2	6.0		7.5	3.5	2.9	6.5
PROJECTIONS										
1983/84	4,480	38	20,760	93	560	17	285	5,040	75,809	378
1984/85	4,540	60	20,800	95	585	25	299	5,145	76,537	394
1985/86	4,640	80	20,900	97	615	30	314	5,255	78,140	411
1986/87	4,720	80	21,000	99	645	30	324	5,365	78,948	423
1987/88	4,805	85	21,000	101	675	30	333	5,480	79,139	434
1988/89	4,900	95	21,000	103	710	35	342	5,610	79,344	445
1989/90	5,005	105	21,000	105	750	40	357	5,755	80,296	462
1990/91	5,125	120	21,000	108	790	40	369	5,915	80,567	477
1991/92	5,255	130	21,000	110	835	45	380	6,090	80,506	490
1992/93	5,385	130	21,000	113	885	50	397	6,270	81,411	510
1993/94	5,520	135	21,000	116	935	50	412	6,455	81,837	528
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	2.0		0.2	2.2	5.1		4.8	2.4	1.7	4.1

B.C. HYDRO

TABLE 4-12

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
SOUTH INTERIOR

	UNDER 35 KM.				35 KM. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	10,824	1,216	15,429	167	767	-72	495	11,591	57,114	662
1973/74	11,489	665	16,538	190	706	-61	584	12,195	63,469	774
1974/75	12,039	550	17,360	209	766	60	583	12,805	61,851	792
1975/76	12,664	625	18,083	229	838	72	611	13,502	62,213	840
1976/77	13,351	687	17,901	239	957	119	653	14,308	62,343	892
1977/78	13,639	288	18,623	254	1,100	143	680	14,739	63,369	934
1978/79	13,935	296	19,158	267	1,218	118	730	15,153	65,793	997
1979/80	14,038	103	19,199	269	1,365	147	768	15,403	67,358	1,037
1980/81	14,172	134	18,302	259	1,601	236	801	15,773	67,227	1,060
1981/82	14,450	278	18,613	269	1,777	176	810	16,227	66,491	1,079
1982/83	14,611	161	18,907	277	1,874	97	867	16,485	69,351	1,144
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	3.0		2.1	5.2	9.3		5.8	3.6	2.0	5.6
PROJECTIONS										
1983/84	14,810	199	18,900	280	1,950	76	877	16,760	69,023	1,157
1984/85	15,090	280	19,000	287	2,035	85	920	17,125	70,454	1,207
1985/86	15,380	290	19,100	294	2,165	130	979	17,545	72,519	1,273
1986/87	15,705	325	19,200	302	2,275	110	1,010	17,980	72,950	1,312
1987/88	16,075	370	19,300	310	2,390	115	1,035	18,465	72,847	1,345
1988/89	16,475	400	19,400	320	2,510	120	1,062	18,985	72,760	1,382
1989/90	16,895	420	19,600	331	2,635	125	1,088	19,530	72,678	1,419
1990/91	17,330	435	19,800	343	2,765	130	1,123	20,095	72,940	1,466
1991/92	17,780	450	20,000	356	2,900	135	1,157	20,680	73,148	1,513
1992/93	18,250	470	20,200	369	3,045	145	1,197	21,295	73,507	1,566
1993/94	18,750	500	20,400	383	3,195	150	1,236	21,945	73,774	1,619
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	2.3		0.7	3.0	5.0		3.3	2.6	0.6	3.2

B.C. HYDRO

TABLE 4-13

GENERAL ACCOUNTS DETAIL
HISTORIC & PROBABLE PROJECTIONS
VANCOUVER ISLAND

	UNDER 35 KM.				35 KM. & OVER			TOTAL		
	AVG NO ACCOUNTS	ANNUAL INCREASE	AVG USE (KW.H)	SALES (GW.H)	AVG NO ACCOUNTS	ANNUAL INCREASE	SALES (GW.H)	AVG NO ACCOUNTS	AVG USE (KW.H)	SALES (GW.H)
HISTORIC										
1972/73	17,971	796	16,471	296	1,021	-44	486	18,992	41,333	782
1973/74	18,850	879	17,644	333	971	-50	551	19,821	44,599	884
1974/75	19,770	920	18,311	362	1,040	69	572	20,810	44,883	934
1975/76	20,890	1,120	19,244	402	1,136	96	605	22,026	45,719	1,007
1976/77	22,046	1,156	18,960	418	1,334	198	782	23,380	47,904	1,120
1977/78	22,177	131	19,525	433	1,569	235	785	23,746	51,293	1,218
1978/79	22,597	420	19,284	436	1,789	190	835	24,386	52,174	1,271
1979/80	22,902	305	19,495	447	1,954	195	889	24,856	53,728	1,336
1980/81	23,071	169	19,444	449	2,234	280	946	25,305	55,111	1,395
1981/82	23,416	345	20,131	471	2,474	240	1,003	25,890	56,948	1,474
1982/83	23,584	168	19,311	454	2,767	293	1,009	26,351	55,536	1,463
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83	2.8		1.6	4.4	10.5		7.6	3.3	3.0	6.5
PROJECTIONS										
1983/84	23,790	206	19,340	460	2,920	153	1,048	26,710	54,461	1,508
1984/85	24,080	290	19,320	465	3,060	140	1,106	27,140	57,889	1,571
1985/86	24,390	310	19,380	471	3,225	165	1,167	27,615	59,322	1,638
1986/87	24,740	350	19,380	477	3,375	150	1,202	28,115	59,718	1,679
1987/88	25,110	370	19,460	487	3,530	155	1,232	28,640	60,825	1,719
1988/89	25,505	395	19,500	497	3,690	160	1,262	29,195	60,261	1,759
1989/90	25,935	430	19,600	508	3,855	165	1,284	29,790	60,156	1,792
1990/91	26,405	470	19,700	520	4,025	170	1,302	30,430	60,215	1,832
1991/92	26,905	500	19,800	533	4,200	175	1,336	31,105	60,865	1,869
1992/93	27,425	520	19,900	546	4,380	180	1,375	31,805	60,402	1,921
1993/94	27,955	530	20,000	559	4,545	165	1,420	32,520	60,849	1,979
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	1.6		0.3	1.9	4.7		3.2	1.9	0.8	2.8

PART FIVE

ELECTRIC - PROBABLE TRANSMISSION RATE SALES

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PART FIVE

ELECTRIC - PROBABLE TRANSMISSION RATE SALES

5.1 Introduction

The Transmission Rate[1] category comprises approximately 65 large industrial and institutional loads and accounted for 9 046 GW.h, or 32% of total billed electric sales in 1982/83. The sales (and percent share of total Transmission Rate) by sector in 1982/83 were:

- pulp and paper, 4 465 GW.h (49%);
- wood manufacturing, 256 GW.h (3%);
- chemicals for pulp and paper, 1 018 GW.h (11%);
- metals mining and smelting, 2 340 GW.h (26%);
- coal mining, 294 GW.h (3%);
- other, 673 GW.h (8%).

The sales (and percent share) by sector in 1993/94 of total sales of 14 995 GW.h are projected to be:

- pulp and paper, 7 600 GW.h (50%);
- wood manufacturing, 345 GW.h (2%);
- chemicals for pulp and paper, 1 510 GW.h (10%);
- metals mining and smelting, 3 560 GW.h (24%);
- coal mining, 840 GW.h (6%);
- other, 1 140 GW.h (8%).

See Figure 5-1 for a graphical representation of historic and projected sales by sector.

The forecast of electric energy sales requirements and methodology used for each sector are presented in the following sections.

5.2 Pulp and Paper and Wood Manufacturing

The pulp and paper and wood manufacturing sector accounted for 4 721 GW.h or 52% of B. C. Hydro's Transmission Rate sales in 1982/83, of which pulp and paper accounted for over 4 200 GW.h. To assist in the electric energy forecast of this sector, B. C. Hydro commissioned Woodbridge, Reed and Associates Ltd. to update its 1982 study Projected Energy Requirements to the Year 2000 - B. C. Forest Industry. This study, which is extended to the Year 2002, is used as a basis for the development of the electric energy forecast presented in this section.

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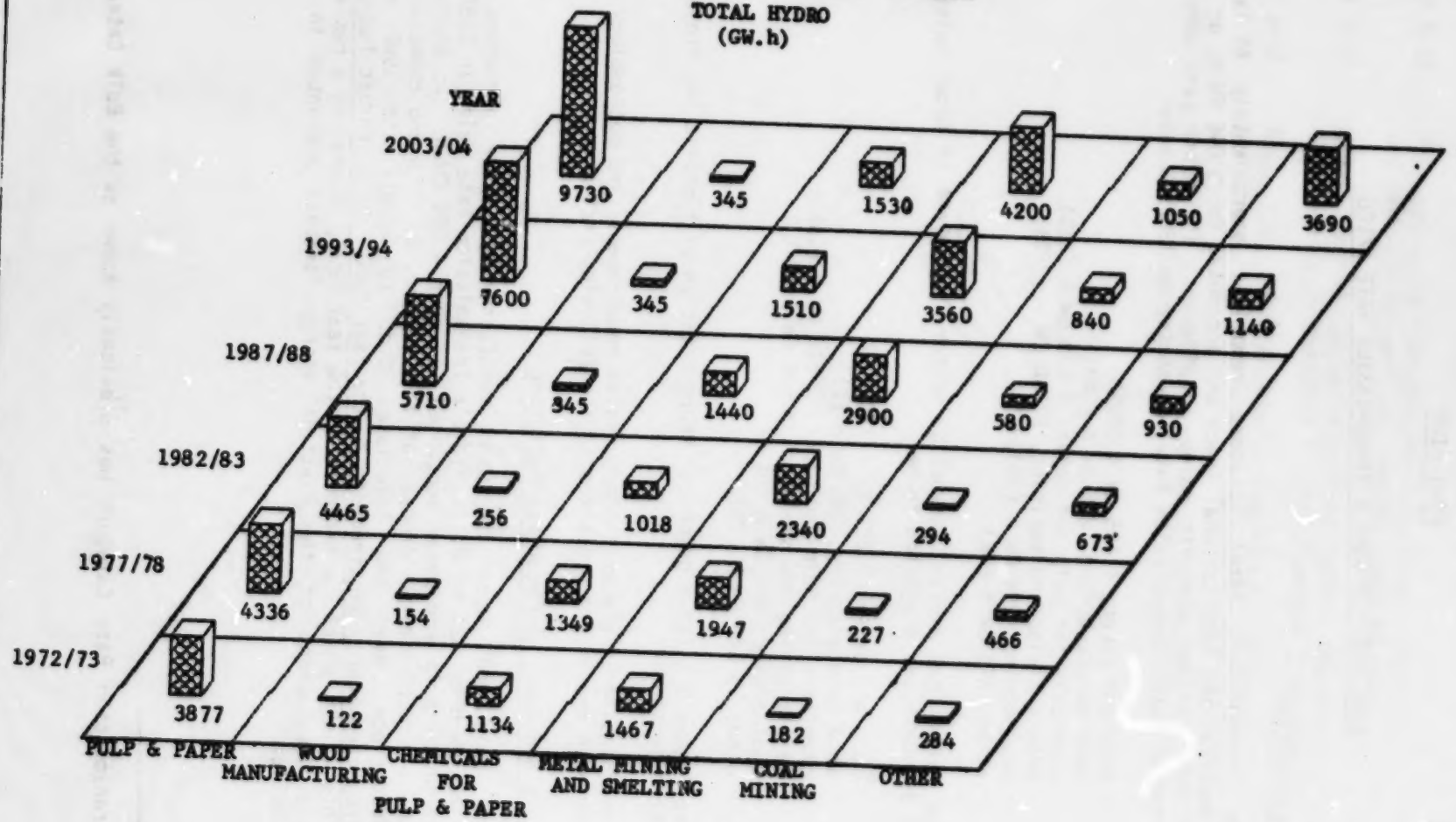
1 The Transmission Rate Category was previously known as the Bulk Category.

Figure 5-1

TRANSMISSION RATE SALES



5.2.1 Pulp and Paper

General

The pulp and paper industry in the Province of British Columbia presently includes 24 mills of varied size and level of integration. The plants range from facilities which produce only market pulp for shipment and further processing to fully integrated mills producing kraft paper and newsprint products. Two plants located in the Lower Mainland area upgrade purchased market pulp into fine paper or tissue products while a third converts secondary fiber and market pulps to paperboards. The production of products is divided amongst the integrated and non-integrated mills roughly as follows:

	Number of Mills	Fiber Capacity (%)
Non-integrated		
- kraft pulp	12	50
- TMP/CTMP pulp	2	5
Integrated		
- kraft pulp and paper	3	10
- kraft and newsprint	4	35
Fine Papers/Tissues/Paperboard	3	-
	24	100

The pulp and paper industry uses two processes for the generation of pulp fiber: chemical and mechanical. Bleached Kraft Pulping (BKP) is the predominant chemical pulping method in B. C. and has been in use for many years. Chemical pulping produces a much stronger fiber than the mechanical process and utilizes chemicals and heat energy to break down the wood rather than work (mechanical) energy used in mechanical pulping. Chemical pulping converts about 45% of the raw material (wood) to finished pulp and, on a per ton of finished product basis requires 33% to 50% of the electric energy used by mechanical pulping.

The oldest of the mechanical pulping methods is stone groundwood, which until recently has been the primary input to newsprint production. In this process, wood is pressed against a rotating stone grinding wheel and water is used for lubrication, cooling and as a carrying medium. Refiner Mechanical Pulp (RMP) was the first major new development in mechanical pulping and uses refiners or discs to produce fiber. RMP has been in use for some time and was the first step toward the more recent development of Thermo-Mechanical Pulping (TMP) and most recently Chemi-Thermo Mechanical Pulping (CTMP). Each of these process developments, which utilize nearly all of the raw material, has led to the production of stronger fibers. The electric energy consumption levels for chemical and mechanical pulping are typically as follows:

Pulp Type	kW.h/Air Dried Metric Tonne (ADMT)	
	Slush Pulp (Internally Used)	Machine Dried Pulp (Market)
Chemical (BKP)	400	800
Stone Groundwood (SGWP)	1 600	N/A
Refiner Groundwood (RMP)	2 200	2 800
Thermo-Mechanical (TMP)	2 200	2 800
Chemi-Thermo Mechanical (CTMP)	1 650	2 200

N/A - Not applicable i.e. not produced in B. C.

The integrated kraft paper and newsprint mills utilize the SGW, RMP, TMP and BKP processes. Kraft pulp is used for the manufacture of kraft paper/paperboard for products such as bags and boxes and for inclusion with mechanical pulp to add strength to newsprint. Stone groundwood, the traditional process used for the mechanical pulp portion of newsprint, is slowly being replaced by TMP, with all but one news mill now utilizing some portion of this process. The one mill that does not use TMP uses RMP as well as SGW.

At present, six mills utilize mechanical (RMP, TMP and CTMP) processes of which four produce slush pulp for internal use and two, Finlay Forest Industries of MacKenzie and Quesnel River Pulp at Quesnel produce market pulp. Quesnel is presently coverting to bleached CTMP, a product which is forecast to be the main market pulp at new facilities. Bleached CTMP is expected to be used extensively for the manufacture of tissues, printing/writing paper and paperboard.

Woodbridge, Reed Projections

Overall, a major shift to the newer TMP and CTMP processes is forecast by Woodbridge, Reed. The CTMP process is expected to be utilized by all new greenfield market pulp mills in the province. Kraft pulp will continue to be used for the production of papers and paperboard. However, any growth in domestic demand for chemical paper pulp will be met by the redirection of chemical pulp to paper from market pulp production. Only incremental increases in chemical pulp production at existing mills are forecast for the province. Newsprint capacity will be systematically reduced as newsprint machines are converted to the production of higher value added printing papers.

The specific observations and projections made by Woodbridge, Reed that have the greatest impact on electrical energy sales are:

- since 1980, total pulp and paper production has declined due to the downturn in the world economy, however, production capacity has increased by approximately 15%. The operating rate of approximately 70% in 1982 is projected to progressively increase to over 90% in 1985. A decline to around 80% in 1987 is assumed followed by a rate of 88% thereafter;

- it is projected that TMP will completely replace the stone groundwood process in existing mills by 1994;

- new greenfield market bleached CTMP mills will start to be built in the late 1980's. Two are projected to be built by 1990 with a further five in the 1990's. As well three or four CTMP mills integrated with existing kraft pulp mills are forecast for the 1990's;

- total pulp production is forecast to grow at an annual average rate of 1.9% from 1980 (the last peak year) to the 1988-92 period and by 2.2% from the 1988-92 period to the 1998-2002 period. Overall paper production growth is projected to be similar.

- essentially, the greatest growth in capacity is anticipated in the Interior after 1985. The majority of the greenfield CTMP mills are projected to occur in the Central Interior;

- total electrical use in pulp and paper mills in the B. C. Hydro service area is projected by Woodbridge, Reed to increase from 6 800 GW.h in 1980 to 9 970 in the 1988-92 period, an average annual growth of 3.9%. By 1998-2002 total use is projected at 13 550 GW.h an annual average growth from 1988-92 of 3.1%. This growth, which is significantly higher than the growth in pulp production is a direct result of the shift to the TMP and CTMP pulping processes;

- self generation is projected to increase from 2 050 GW.h in 1980 to 3 885 GW.h in the 1998-92 period. This growth is not as high as for total electricity use hence the growth rates for purchased electricity are somewhat higher. Refer to Appendix A for further discussion of self-generation.

Refer to TABLE 5-1 for the Woodbridge, Reed projection of electric requirements in the B. C. Hydro service area.

Pulp and Paper Sales as Projected by B. C. Hydro

B. C. Hydro used the consultant's estimates of purchased electricity requirements as the basis for the forecast. However, the following adjustments were made:

- the consultant's estimates reflect only the electric energy requirements for pulp and paper production. In some pulp and paper complexes there is wood manufacturing carried on as an integral part of the operation. B. C. Hydro actual sales figures for pulp and paper include this wood manufacturing load which is estimated to be 200 GW.h in 1982/83 and to increase to 250 GW.h by 1985/86. An estimate of this wood manufacturing load is added on to the consultant's projections to allow comparison to the B. C. Hydro forecast;

- the consultant's estimates in the 1984 to 1986 period are adjusted downward to reflect the less rapid increase in pulp and paper production assumed in the Long-Term Economic Outlook;

TABLE 5-1

B. C. PULP AND PAPER INDUSTRY
ELECTRIC POWER DEMAND - B. C. HYDRO SERVICE AREA
(GW.h per year)

COMPARISON OF CONSULTANT AND B. C. HYDRO PROJECTIONS

Woodbridge, Reed Projections				B. C. Hydro	
Calendar Year	Total Use	Self-Generation	Purchased Power	Fiscal Year	B. C. Hydro Forecast Sales
1980	6 815	2 051	4 764	1980/81	4 814 (Actual)
81	5 999	1 824	4 175	81/82	4 375 (Actual)
82	6 453	2 131	4 322	82/83	4 618 (Actual)
83	7 475	2 635	4 840	83/84	5 045
84	8 524	2 905	5 619	84/85	5 495
1985	8 985	3 016	5 969	1985/86	5 845
86	8 776	3 033	5 743	86/87	5 845
87	7 993	2 715	5 278	87/88	5 845
1988-92*	9 968	3 297	6 673	1990/91	6 651
1993-97*	12 487	3 686	8 801	1995/96	8 506
1998-02*	13 551	3 886	9 665	2000/01	9 676

* Annual Average

Notes:

[a] Direct comparison of Woodbridge, Reed purchased power and B. C. Hydro forecast sales in this table must consider:

- the Woodbridge, Reed figures are calendar year and B. C. Hydro figures fiscal year;
- B. C. Hydro sales figures contain wood manufacturing load that is an integral part of pulp and paper complexes (250 GW.h from 1985/86 on); and
- the Woodbridge, Reed figures have been adjusted slightly as indicated in the text.

[b] The Woodbridge, Reed and B. C. Hydro figures in this table include all pulp and paper sales. Most of the B. C. Hydro sales are in the Transmission Rate category but a small portion is in the General category (150 GW.h in 1982/83).

- the consultant's estimates in the 1986 through 1987 period are "smoothed", i.e. shown flat in growth, to avoid projection of an overall negative load growth and to more closely agree with the Long-Term Economic Outlook; and

- the consultant's estimates after 1988 are modified down marginally to reflect the somewhat slower growth in mechanical pulp (CTMP in particular) and chemical pulp production assumed in the Long-Term Economic Outlook.

TABLE 5-1 presents a comparison of the Woodbridge, Reed and B. C. Hydro projections.

Column (1) in TABLE 5-2 presents the portion of the pulp and paper load which are Transmission Rate customers. This portion of the load is forecast to grow at 5.0% per year from 1982/83 to 1993/94. The higher growth rates in the first three years reflect the poor market and low production volumes of 1982 rather than expansion in facilities. The growth in the latter years is due largely to projected new facilities. The 3 100+ GW.h increase in 1993/94 over 1982/83 is approximately due to:

- 1 500 GW.h from higher utilization of existing capacity;
- 1 300 GW.h from new CTMP facilities;
- 300 GW.h from the substitution of TMP for stone groundwood at existing mills.

The net effect in the period of any incremental kraft pulp expansions and projected additional self-generation by BKP mills is such that no additional electricity requirements are anticipated for BKP expansions.

5.2.2 Wood Manufacturing

General

Wood manufacturing includes both Transmission Rate and General customers. As well some wood manufacturing load is an integral part of pulp and paper complexes and is metered as pulp and paper load. There is also some self-generation in the industry.

The consultant provided estimated calendar year production figures for sawmills, veneer and plywood operations and other panel products. These operations account for nearly all the electrical requirements of the industry with the only other significant user being the shingle and shake industry. The production figures include all wood manufacturing whether it is served as a Transmission Rate or General customer, or whether it is part of a pulp mill operation or is served by cogeneration. The consultants provided electricity conversion factors for the various wood industry components, however, they did not attempt to estimate the total electricity requirements.

TABLE 5-2

TRANSMISSION RATE

ELECTRIC ENERGY SALES FOR PULP AND PAPER AND WOOD MANUFACTURING (GW.h)

Year	Pulp and Paper	Wood Manufacturing
1981/83 (Actual)	4 271	223
1982/83 (Actual)	4 465	256
1983/84	4 930	280
1984/85	5 370	310
1985/86	5 710	335
1986/87	5 710	345
1987/88	5 710	345
1988/89	5 960	345
1989/90	6 210	345
1990/91	6 510	348
1991/92	6 860	345
1992/93	7 250	345
1993/94	7 600	345
2003/04	9 730	345

Note:

Pulp and paper sales on this table cannot be compared directly to those shown for BCH on TABLE 5-1 since the sales on TABLE 5-1 include those for the General category as well.

Base Year Consumption

Utilizing the above information it was possible, with some adjustments and estimates, to closely match 1982 production figures with actual B. C. Hydro sales figures for calendar 1982 and thus fiscal 1982/83. The adjustment and results for fiscal 1982/83:

- the average Province wide conversion factor of 140 kW.h per Mfbm used in 1982 for rough green lumber was thought by the consultants to be too high for the Interior. The figure was adjusted down by 24 kW.h per Mfbm which enabled a better rationalization with actual electricity sales;

- it is estimated that 200 GW.h of wood manufacturing load was metered as part of pulp and paper complexes;

- there was an estimated 145 GW.h of self generation in sawmills; and

- total electricity requirements in the B. C. Hydro service area are estimated at 1 852 GW.h split 1 454 GW.h for sawmills, 305 GW.h for veneer and plywood mills, 45 GW.h for shingle and shake mills, 48 GW.h for other panel products.

Wood Manufacturing Sales

With reconciliation of the starting year production and sales figures the consultant's production estimates for the various portions of the industry were used along with the appropriate conversion factors to estimate total electricity requirements. An adjustment was made for shingle and shake mills for which the consultants did not provide production estimates. A long term declining trend in shingle and shake production is projected consistent with the 1982 consultant study.

Adjustments were then made for self-generated electricity, an assumption of 10% of sawmill requirements was used. An estimate of electricity integrated with pulp and paper mills was then made in order to estimate wood manufacturing electricity requirements supplied directly by B. C. Hydro.

The electric energy requirements for wood manufacturing are apportioned between Transmission Rate and General Rate based on existing Transmission customers and plans of existing General customers to transfer to Transmission. See TABLE 5-2 for sales in the Transmission Rate category.

5.3 Chemicals for Pulp and Paper

The pulp and paper industry requires chemicals for processing with the use being largely in the chemical pulping process. With the limited expansion projected by the pulp and paper consultants for chemical pulp, little growth is seen in the chemical industry and hence in electricity requirements for production.

As a basis for projecting electricity requirements a relationship was developed between the average historical use of electricity in the chemical industry and the production of chemical pulp. The consultant's modified estimates of chemical pulp were then used along with the developed ratio to project electricity requirements in the chemical industry. The implicit assumptions are that the chemical industry continues to exist largely for the B. C. pulp and paper industry and that the pulp and paper industry purchase all their chemicals within B. C. Little or no conservation or process change is anticipated in the initial ten year time frame.

Historic sales reached 1 427 GW.h in 1980/81. This level is projected to again be reached in 1985/86 with only modest long term expansion occurring after that. See TABLE 5-3 for projected sales in the Transmission Rate.

TABLE 5-3

TRANSMISSION RATE

ELECTRIC ENERGY SALES FOR
CHEMICALS FOR PULP AND PAPER
(GW.h)

Year	Chemicals for Pulp and Paper
1981/82 (Actual)	1 241
1982/83 (Actual)	1 018
1983/84	1 200
1984/85	1 400
1985/86	1 440
1986/87	1 440
1987/88	1 440
1988/89	1 460
1989/90	1 470
1990/91	1 490
1991/92	1 490
1992/93	1 500
1993/94	1 510
2003/04	1 530

5.4 Metals Mining and Smelting

This portion of the forecast is based on a study commissioned by B. C. Hydro, Forecast of Power Consumption by the B. C. Mining and Smelting Industries by H. N. Halvorson Consultants Limited, March 1983. The study is essentially an update of the 1982 forecast that B. C. Hydro commissioned Wright Engineers Limited and H. N. Halvorson Consultants Limited to undertake.

The study examines, on a mine by mine basis, the existing and potential production of major metals in B. C.; copper, molybdenum, lead/zinc and silver/gold. Smelting activity examined included lead/zinc, copper and aluminum smelters, molybdenum roasters and ferrosilicon production.

5.4.1 Metals Mining

The consultant's study reviewed the world demand and price outlook for the major metals produced in B. C. This information was used to project the production from existing and potential B. C. mines.

Almost all electricity supplied by B. C. Hydro to the metal mining industry goes to large, low grade, open pit copper and molybdenum mines with copper being by far dominant. This situation is projected to remain the same through the forecast period.

Copper is projected to return to 1981 peak year production levels in 1984. Gradual increased production through the remainder of the 1980's will come from expansions at existing mines and reopening of some presently closed mines. It is not until the 1990's that new greenfield mines of any size are expected. The closure of some existing mines due to ore depletion will, however, keep production levels fairly steady through the 1990's.

Molybdenum will not return to 1981 peak year production levels until 1985 and prices are not projected to be high enough through the remainder of the 1980's to promote any new mine development. Even in the 1990's no new large, low grade deposits are projected to be developed and average production will rise to only marginally over the late 1980's level.

The projections of electricity requirements in the consultant's study were used as the basis for B. C. Hydro's Transmission Rate forecast which is shown on TABLE 5-4. The following considerations resulted in the modified projections used by B. C. Hydro:

- the consultant's 1982 calendar year actual does not agree precisely with B. C. Hydro's actual 1982/83 fiscal year sales because of the calendar year-fiscal year relation and also due to the transfer of two Transmission Rate customers (Bell and Granisle) to General 35 kW and over rate in the fall of 1982. The transfers were due to closing of operations making the General Rate more attractive. Transfer back to the Transmission Rate will undoubtedly occur once significant production is resumed;

- the 1985/86 consultant's electricity requirements were modified down to reflect the somewhat slower recovery for molybedenum assumed in the Long-Term Economic Outlook;

- the consultant's firm purchased plus half of the tentative was generally used. The consultant's definition of tentative is production after the earliest likely closing date of the mine due to ore depletion or mines presently closed that may not reopen. It is likely some of the presently closed mines will reopen and that further recoverable ore will be found at existing operations. Hence a 50% factor for tentative is assumed as reasonable;

- in all cases growth and decline in electric energy requirements are trended or smoothed from the specific mine-by-mine assessment to avoid sharp discontinuities in the forecast; and

- the Schaft Creek and Stikine copper deposits in Northwest B. C. are projected by the consultant to be developed with self-generation in the late 1990's and early 2000's. This forecast assumes B. C. Hydro will serve the two mines since:

  - present government policy indicates that generation of hydro power of the magnitude required is to be carried out by B. C. Hydro;

  - other types of generation would be expensive; and

  - B. C. Hydro may eventually develop the Iskut-Stikine for generation which would allow transmission lines to be within economic reach of the two deposits.

5.4.2 Smelting

There are three existing smelters in B. C., Cominco's lead/zinc, Afton's copper and Alcan's aluminum smelter. Other, smaller metal processing activities are not large electricity users and thus not included here for discussion.

The consultant, based on the same world outlook and price approach as for metals mining, projects considerable expansion. Specifically projected are:

- modernization and expansion of the existing Cominco lead/zinc smelter;

- a second lead/zinc smelter, requiring 1 000 GW.h of electricity at full production, by 1995;

- closure of the existing Afton copper smelter sometime after 1986 (note: the smelter is now to be closed in 1983);

- a new copper smelter, requiring 230 GW.h of electricity at full production, in the 1990-95 period;

- two additional aluminum smelters by Alcan starting at the earliest in 1990 and 1995;

- a potential fourth aluminum smelter at the end of the study period i.e. 2002; and

- a ferrosilicon plant, requiring 440 GW.h of electricity at full production, starting operation in the 1990-95 period;

The consultant indicates that the copper smelter, the new lead/zinc smelter and the fourth aluminum smelter would purchase electricity from B. C. Hydro. The B. C. Hydro forecast is shown on TABLE 5-4 and includes/assumes:

- the new lead/zinc smelter starting in 1995;

- the new copper smelter starting in 1992;

- expansion of Cominco's lead/zinc smelter to the level projected by the consultant but at a slower rate;

- no specific aluminum smelter served by B. C. Hydro; and

- a ferrosilicon plant starting operations in 1992 but not directly served by B. C. Hydro, i.e. it will be established in the Cominco/WKP&L service area.

TABLE 5-4

TRANSMISSION RATE

ELECTRIC ENERGY SALES FOR
METALS MINING AND SMELTING
(GW.h)

Year	Metal Mining	Smelting	Total
1981/82 (Actual)	2 637	-	2 637
1982/83 (Actual)	2 340	-	2 340
1983/84	2 350	-	2 350
1984/85	2 500	-	2 500
1985/86	2 700	-	2 700
1986/87	2 900	-	2 900
1987/88	2 900	-	2 900
1988/89	3 050	-	3 050
1989/90	3 100	-	3 100
1990/91	3 100	-	3 100
1991/92	3 200	-	3 200
1992/93	3 300	110	3 410
1993/94	3 300	260	3 560
2003/04	2 750	1 450	4 200

5.5 Coal Mining

This year B. C. Hydro commissioned a study of coal, Forecast of Coal Mining Activity to 2002 by H. N. Halvorson Consultants Ltd., March 1983.

The study examines coal from a world demand/supply and price perspective to assess the potential for sales of B. C. metallurgical (coking) and thermal coals. Then, based on this assessment, forecasts of production for the B. C. industry, and its electricity requirements, are prepared.

Metallurgical coal accounts for the large portion of coal shipped from B. C. (88% in 1982) with the majority going to the Japanese steel industry. The assessment by Halvorson of the likely growth of the Japanese steel industry and of the available supply of coking coal for that market indicates that there will probably be no new mines in the province over the forecast period and that existing mines, and those under construction, will probably operate below full capacity for some time.

Thermal coal accounted for only 12% of the coal shipped from B. C. in 1982. Production is forecast to be fairly flat until the late 1980's when further contracts with off-shore power plants are expected. The development of small, high quality, easily accessible thermal coal mines are projected at that time. By the year 2000 the production of thermal coal is projected to increase to 9.8 million tonnes per year from a current level of 2.4 million tonnes and to represent 32% of the total B. C. coal production.

The consultant's study was used, with no significant changes, for the projection of electricity requirements. The projected electric energy requirements are presented in TABLE 5-5.

5.6 Petrochemicals, LNG and Natural Gas Liquids Extraction

As part of the preparation of the 1983 Load Forecast, Confer Consulting Ltd. was asked to prepare a forecast of the activity and electricity requirements for liquified natural gas (LNG), natural gas liquids (NGL) extraction and petrochemicals.

The assessment of the LNG market indicates that forecasts of lower economic and electricity growth in Japan have reduced the need for LNG projects around the world and that lower world crude oil price forecasts have reduced the viability of the potential LNG projects. An LNG load of approximately 1 000 GW.h which was included in the 1982 probable load forecast has been removed from the current probable projection. However, as indicated in Part Nine of this report, an allowance is made for this or a similar type of load in the probable high forecast.

TABLE 5-5

TRANSMISSION RATE

ELECTRIC ENERGY SALES FOR COAL MINING
(GW.h)

Year	Coal Mining
1981/82 (Actual)	326
1982/83 (Actual)	294
1983/84	350
1984/85	455
1985/86	530
1986/87	575
1987/88	580
1988/89	650
1989/90	675
1990/91	750
1991/92	780
1992/93	800
1993/94	840
2003/04	1 050

Without an LNG project, a large scale NGL extraction plant, for which 300 GW.h was included in the 1982 forecast, is unlikely to occur. However, a smaller scale NGL extraction plant is expected and a load of 100 GW.h per year is included in the "other" category of the Transmission Rate.

The 1982 Load Forecast also included 430 GW.h for an ethylene and derivatives plant which would utilize the NGL as a feedstock. With a lower level of NGL extraction than forecast last year, combined with a deterioration of the economics of an ethylene plant in the past year, the ethylene and derivatives plant has been removed from the forecast.

5.7 Other Transmission Rate Loads

There are a number of other Transmission Rate loads in other sectors of the economy. TABLE 5-6 shows the major sectors and the forecast electric energy sales.

No new refineries are projected during the forecast period. The high initial growth results from a transfer from General to Transmission Rate category. The moderate longer term growth at existing facilities is related to the transportation sectoral economic projection with moderation to reflect a declining oil dependence.

TABLE 5-6

TRANSMISSION RATE

ELECTRIC ENERGY SALES FOR
OTHER TRANSMISSION RATE LOADS
(GW.h)

Year	Refineries	Cement Manufacturing	Bulk Commodity Terminals	UBC Plus Triumf	Remainder	Total
1981/82 (Act)	247.5	128.5	25	154	86	641
1982/83 (Act)	272	114	34	166	87	673
1983/84	300	115	45	165	90	715
1984/85	310	120	60	165	120	775
1985/86	315	130	80	170	135	830
1986/87	320	135	90	175	140	860
1987/88	325	140	95	180	190	930
1988/89	330	145	100	180	255	1 010
1989/90	335	150	100	185	265	1 035
1990/91	340	150	105	185	275	1 055
1991/92	345	155	110	190	285	1 085
1992/93	350	160	115	190	295	1 110
1993/94	355	165	120	195	305	1 140
2003/04	405	190	150	230	2 715	3 690

No new cement manufacturing facilities are projected during the forecast period. Growth results from increased usage of capacity already in place and is related to the construction sectoral economic projections.

Several new bulk commodity terminals are projected during the forecast period. The major contributor to electric requirements are grain terminals with the high growth through 1983/84 due to transfer from General to Transmission Rate of an existing customer. The new Prince Rupert terminal will come on-line in 1985/86. Growth in grain terminals is projected to be relatively flat through the last half of the period. Coal terminal growth is projected to be as a result of transfer to Transmission Rate of the Roberts Bank complex and completion of the Ridley Island terminal for shipment of northeast coal. Usage and electric consumption levels are based on projected coal shipments. An unspecified "other" terminal is allowed for in the early 1990's.

UBC plus Triumf[a] is projected to grow from continuing expansion of UBC. The overall forecast methodology for universities and colleges is given in the General Section. UBC growth is then estimated and removed from the overall projections.

The "remainder" loads through 1993/94 consist of transportation, a Federal Establishment (DND - Esquimalt), Natural Gas Liquids (NGL) extraction facility and unspecified. The transportation consists of electrification of the BCR spur line to the northeast coal development and conversion from diesel to electric pumping of Trans Mountain Oil at Kamloops. A small scale NGL extraction facility is projected to start operation in 1987. Growth in the various facilities is based on discussions with the customers and on various sectoral studies done by and for B. C. Hydro.

The "remainder" load after 1993/94 contains provision for anticipated 'new load'. Possible new loads that have been discussed for B. C. are: rail electrification, commercial vehicle electrification, pumping for coal slurry pipeline, undefined smelting loads, manufacturing or 'processing' facilities, unspecified major project(s).

5.8 Total Transmission Rate Electric Energy Sales

TABLE 5-7 summarizes by sector the forecast of transmission rate electric energy sale requirements at the total B. C. Hydro level.

TABLES 5-8 through 5-12 give the sector composition of sales for each Division.

TABLE 5-13 gives projections by individual transmission rate customer for three years i.e. through 1985/86.

[a] The Triumf Research Facility load is included in the UBC transmission rate service.

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TABLE 5-7

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
TOTAL HYDRO

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING & SMELTING			COAL MINING			OTHER			TOTAL SALES	
	-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	-ENERGY-
HISTORIC	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)
1972/73	598	3,877	54.9	27	122	1.7	161	1,134	16.0	247	1,467	20.8	33	182	2.6	45	284	4.0	1,111	7,066
1973/74	590	4,118	53.0	31	160	2.1	164	1,254	16.1	253	1,759	22.6	33	181	2.3	46	304	3.9	1,117	7,776
1974/75	631	4,141	53.7	31	144	1.8	171	1,237	16.0	251	1,695	22.0	35	199	2.6	47	298	3.9	1,166	7,714
1975/76	633	3,398	49.9	31	129	1.9	173	975	14.3	256	1,715	25.2	35	211	3.1	70	380	5.6	1,198	6,808[a]
1976/77	626	4,360	53.4	31	146	1.8	184	1,254	15.3	260	1,786	21.9	36	165	2.0	75	485	5.6	1,212	8,166
1977/78	638	4,336	51.1	33	154	1.8	185	1,349	15.9	280	1,947	23.0	42	227	2.7	76	466	5.5	1,254	8,479
1978/79	704	4,768	52.2	44	194	2.1	189	1,419	15.5	290	1,963	21.5	44	265	2.9	93	524	5.8	1,364	9,133
1979/80	676	4,693	50.9	49	205	2.2	189	1,372	14.9	294	2,085	22.6	47	259	2.8	108	603	6.6	1,363	9,217
1980/81	708	4,738	49.4	56	234	2.4	191	1,427	14.9	337	2,264	23.6	50	302	3.1	120	632	6.6	1,484	9,597
1981/82	780	4,271	45.7	57	223	2.4	186	1,241	13.3	368	2,637	28.2	55	326	3.5	115	641	6.9	1,861	9,339[b]
1982/83	845	4,465	49.4	71	256	2.8	172	1,018	11.3	378	2,340[c]	25.9	62	294	3.2	129	673	7.4	1,657	9,046
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		1.4			7.7			-1.1			4.8			4.9			9.0			2.5
PROJECTIONS																				
1983/84	818	4,930	50.2	71	280	2.8	177	1,200	12.2	323	2,350	23.9	85	350	3.6	135	715	7.3	1,609	9,825
1984/85	831	5,370	49.7	73	310	2.9	194	1,400	13.0	346	2,500	23.1	92	455	4.2	160	775	7.2	1,698	10,810
1985/86	862	5,710	49.5	75	335	2.9	198	1,440	12.5	366	2,700	23.4	100	530	4.6	168	830	7.2	1,769	11,545
1986/87	862	5,710	48.3	77	345	2.9	198	1,440	12.2	393	2,900	24.5	105	575	4.9	174	860	7.3	1,809	11,830
1987/88	862	5,710	48.0	77	345	2.9	198	1,440	12.1	393	2,900	24.4	107	580	4.9	185	930	7.8	1,882	11,905
1988/89	902	5,960	47.8	77	345	2.8	198	1,460	11.7	412	3,050	24.4	119	650	5.2	196	1,010	8.1	1,984	12,475
1989/90	932	6,210	48.4	77	345	2.7	199	1,470	11.5	418	3,100	24.2	123	675	5.3	199	1,038	8.1	1,948	12,835
1990/91	973	6,510	49.1	77	345	2.6	206	1,490	11.2	420	3,100	23.4	134	750	5.7	203	1,055	8.0	2,013	13,250
1991/92	1,018	6,860	49.9	77	345	2.5	206	1,490	10.8	441	3,200	23.3	140	780	5.7	212	1,085	7.9	2,094	13,760
1992/93	1,073	7,250	50.3	77	345	2.4	206	1,500	10.4	465	3,410	23.7	140	800	5.5	216	1,110	7.7	2,177	14,415
1993/94	1,122	7,600	50.7	77	345	2.3	206	1,510	10.1	475	3,540	23.7	145	840	5.6	219	1,140	7.6	2,244	14,995
2003/04		9,730	47.4		345	1.7		1,530	7.4		4,200	20.4		1,050	5.1		1,490	7.2		20,545
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		5.0			2.7			3.6			3.9			10.0			4.9			4.7
10 YEARS 93/94-03/04		2.5						0.1			1.7			2.3			12.5			3.2

Notes: a
Transmission Rate sales in 1975/76 abnormally depressed by approximately 1400 GW.h as a direct result of 3 months pulp and paper strike.

b
Transmission Rate sales in 1981/82 abnormally depressed by approximately 900 GW.h as a direct result of 1.5 months pulp and paper strike.

c
Includes positive adjustment of 52 GW.h for missed billing during the period 29 December 1980 - 30 November 1981 at Lornex Mine Substation.

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TABLE 5-8

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
LOWER MAINLAND

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING & SMELTING			COAL MINING			OTHER			TOTAL SALES	
	-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	-ENERGY-
	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)
HISTORIC																				
1972/73	99	598	31.8	27	122	6.5	132	945	50.2							35	217	11.5	293	1,882
1973/74	103	683	32.7	25	124	5.9	135	1,053	50.3							35	232	11.1	298	2,092
1974/75	113	733	34.4	26	124	5.8	140	1,044	49.0							36	231	10.8	315	2,132
1975/76	118	601	33.0	25	112	6.2	139	796	43.7							60	312	17.1	342	1,821
1976/77	108	717	32.2	25	122	5.[illegible]	148	1,001	44.9							64	388	17.4	345	2,228
1977/78	121	708	30.2	28	128	5.5	150	1,108	47.3							65	400	17.0	364	2,344
1978/79	121	782	30.5	33	152	5.9	155	1,171	45.6							83	463	18.0	392	2,568
1979/80	123	835	31.5	32	152	5.7	155	1,146	43.1							88	524	19.7	398	2,657
1980/81	149	815	30.2	33	152	5.6	157	1,171	43.4							101	561	20.8	440	2,699
1981/82	163	909	34.0	33	137	5.1	155	1,056	39.5							99	573	21.4	450	2,677
1982/83	159	776	33.4	40	145	6.2	133	819	35.3							106	582	25.1	438	2,322
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		2.6			1.7			-1.4									10.4			2.1
PROJECTIONS																				
1983/84	165	910	35.1	41	165	6.4	139	920	35.5							105	595	23.0	450	2,590
1984/85	174	1,050	35.6	42	180	6.1	153	1,095	37.1							112	625	21.2	481	2,950
1985/86	181	1,180	37.3	43	200	6.3	157	1,130	35.7							115	655	20.7	496	3,165
1986/87	181	1,180	37.0	44	205	6.4	157	1,130	35.5							117	670	21.0	499	3,185
1987/88	181	1,180	36.9	44	205	6.4	157	1,130	35.3							117	685	21.4	499	3,200
1988/89	193	1,270	38.3	44	205	6.2	157	1,150	34.7							119	690	20.8	513	3,315
1989/90	198	1,300	38.6	44	205	6.1	157	1,155	34.3							120	705	21.0	519	3,365
1990/91	204	1,340	39.1	44	205	6.0	163	1,170	34.1							123	715	20.8	534	3,430
1991/92	212	1,390	39.7	44	205	5.9	163	1,170	33.4							130	735	21.0	549	3,500
1992/93	224	1,470	40.7	44	205	5.7	163	1,160	32.7							134	755	20.9	565	3,610
1993/94	230	1,510	41.0	44	205	5.6	163	1,190	32.3							137	780	21.2	574	3,685
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		6.2			3.2			3.5									2.7			4.3

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TABLE 5-9

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
CENTRAL INTERIOR

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING & SMELTING			COAL MINING			OTHER			TOTAL SALES	
	-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	-ENERGY-
	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)
HISTORIC																				
1972/73	115	660	60.0																	
1973/74	103	726	54.5				16	84	7.3	67	374	32.7								
1974/75	121	715	55.7				16	110	8.2	68	497	37.3							198	1,146
1975/76	124	627	51.3				18	89	7.8	69	479	37.3							187	1,333
1976/77	128	819	59.8				21	101	8.3	69	493	40.4							200	1,283
							23	148	10.7	71	421	30.5							214	1,221
1977/78	124	831	54.9																222	1,388
1978/79	133	880	59.6	5	16	1.1	22	150	9.9	72	534	35.2								
1979/80	117	830	55.2	11	28	1.9	22	154	10.5	76	421	28.6							218	1,519
1980/81	118	784	50.3	10	43	2.7	22	146	9.7	77	500	33.2							236	1,471
1981/82	152	747	49.2	10	39	2.6	22	165	10.6	79	568	36.4							227	1,564
							19	117	7.7	83	598	39.4							229	1,560
1982/83	166	1,035	65.1	17	64	4.0	25	126	7.9	81	324[a]	20.4				8	17	1.1	269	1,518
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		4.2						4.1			-1.4					12	42	2.6	321	1,891
PROJECTIONS																				3.3
1983/84	182	1,120	67.1	16	65	3.9	23	160	9.6	31	220	13.2	12	40	2.4	14	45	3.9	278	1,470
1984/85	183	1,210	62.5	17	70	3.6	25	175	9.0	43	300	15.5	19	110	5.7	22	70	3.6	309	1,935
1985/86	186	1,250	58.3	17	70	3.3	25	180	8.4	58	410	19.1	27	160	7.5	22	75	3.5	335	2,145
1986/87	186	1,250	55.4	17	70	3.1	25	180	8.0	71	510	22.6	28	170	7.5	22	75	3.3	349	2,255
1987/88	186	1,250	54.1	17	70	3.0	25	180	7.8	71	510	22.1	28	170	7.4	33	130	5.6	360	2,310
1988/89	211	1,350	54.8	17	70	2.8	25	180	7.3	71	510	20.7	28	170	6.9	38	185	7.5	390	2,465
1989/90	231	1,540	57.6	17	70	2.6	25	180	6.7	71	510	19.1	32	190	7.1	38	185	6.9	414	2,675
1990/91	256	1,730	60.5	17	70	2.4	26	185	6.5	69	490	17.1	32	200	7.0	38	185	6.5	438	2,860
1991/92	276	1,920	62.7	17	70	2.3	26	185	6.0	69	490	16.0	34	205	6.7	39	190	6.2	461	3,060
1992/93	301	2,110	64.8	17	70	2.2	26	185	5.7	69	490	15.1	34	210	6.5	39	190	5.8	486	3,255
1993/94	326	2,300	66.6	17	70	2.0	26	185	5.4	69	490	14.2	38	220	6.4	39	190	5.5	515	3,455
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		7.5			0.8			3.4			3.8						14.7			7.3

Notes: a Noranda Mines (Bell Copper and Granisle) transferred out of Transmission Rate in 1982.

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TABLE 5-10

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
NORTH COAST

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING & SMELTING			COAL MINING			OTHER			TOTAL SALES	
	-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	-ENERGY-
	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)
HISTORIC																				
1972/73	61	319	98.8							6	4	1.2							67	323
1973/74	61	392	100.0																61	392
1974/75	62	381	100.0																62	381
1975/76	61	381	100.0																61	381
1976/77	59	374	100.0																59	374
1977/78	56	364	100.0																56	364
1978/79	91	499	100.0																91	499
1979/80	59	391	100.0																59	391
1980/81	63	430	90.4	7	13	2.7				8	33	6.9							78	476
1981/82	64	377	71.0	7	25	4.7				22	129	24.3							93	531
1982/83	67	366	73.9	7	23	4.7				21	106	21.4							95	495
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		1.4									38.8									4.4
PROJECTIONS																				
1983/84	70	420	80.8	7	25	4.8				10	75	14.4							87	520
1984/85	70	450	74.4	7	30	5.0				23	120	19.8				10	5	0.8	110	605
1985/86	70	480	66.7	8	35	4.9				24	180	25.0				15	25	3.5	117	720
1986/87	70	480	65.8	8	35	4.8				24	180	24.7				18	35	4.8	120	730
1987/88	70	480	65.8	8	35	4.8				24	180	24.7				18	35	4.8	120	730
1988/89	70	480	63.2	8	35	4.6				24	180	23.7	6	25	3.3	18	40	5.3	126	760
1989/90	70	480	63.2	8	35	4.6				24	180	23.7	6	25	3.3	18	40	5.3	126	760
1990/91	70	480	63.2	8	35	4.6				24	180	23.7	6	25	3.3	18	40	5.3	126	760
1991/92	70	480	63.2	8	35	4.6				24	180	23.7	6	25	3.3	18	40	5.3	126	760
1992/93	70	480	62.7	8	35	4.6				24	180	23.5	6	25	3.3	18	45	5.9	126	765
1993/94	70	480	61.9	8	35	4.5				24	180	23.2	7	35	4.5	18	45	5.8	127	775
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		2.5			3.9						4.9									4.2

B.C. HYDRO

TABLE 5-11

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
SOUTH INTERIOR

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING[a] & SMELTING			COAL MINING			OTHER			TOTAL SALES	
	-PEAK-	-ENERGY-		-PEAK-	-ENERGY-		-PEAK-	-ENERGY-		-PEAK-	-ENERGY-		-PEAK-	-ENERGY-		-PEAK-	-ENERGY-		-PEAK-	-ENERGY-
	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)	X OF TOTAL	(MW)	(GW.H)
HISTORIC																				
1972/73	17	109	10.0							131	883	73.4	33	182	16.6				181	1,094
1973/74	18	115	9.6							132	909	75.4	33	181	15.0				183	1,205
1974/75	19	120	10.0							127	886	73.5	35	199	16.5				181	1,205
1975/76	17	104	9.1							128	834	72.6	35	211	18.3				180	1,151
1976/77	16	129	10.2							133	964	76.7	36	165	13.1				185	1,260
1977/78	16	115	8.6							150	997	74.5	42	227	16.9				208	1,339
1978/79	20	112	7.5							155	1,165	78.6	44	265	17.9				219	1,482
1979/80	20	143	9.3							159	1,137	73.5	47	259	16.7	4	8	0.5	230	1,547
1980/81	20	142	8.6							198	1,193	71.8	50	302	18.2	5	24	1.4	268	1,661
1981/82	19	117	6.1							222	1,433	75.2	55	326	17.1	6	31	1.6	302	1,907
1982/83	21	124	6.6							216	1,445[b]	76.4	62	294	15.5	6	28	1.5	305	1,891
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		1.3									6.1			4.9						5.4
PROJECTIONS																				
1983/84	21	130	6.3							221	1,505	76.9	73	310	15.8	10	35	1.7	325	2,000
1984/85	21	140	6.5							221	1,610	75.1	73	345	16.1	10	50	2.3	325	2,146
1985/86	22	150	6.8							223	1,640	74.2	73	370	16.7	10	50	2.3	328	2,210
1986/87	22	150	6.4							237	1,740	74.2	77	405	17.3	10	50	2.1	346	2,345
1987/88	22	150	6.4							237	1,740	74.2	77	405	17.3	10	50	2.1	346	2,345
1988/89	23	160	6.5							250	1,840	74.2	79	425	17.1	10	55	2.2	362	2,480
1989/90	23	160	6.3							256	1,890	74.4	79	430	17.0	10	55	2.2	368	2,535
1990/91	23	160	6.1							260	1,910	72.9	90	495	18.9	10	55	2.1	383	2,620
1991/92	23	160	5.8							281	2,010	73.2	94	520	18.9	10	55	2.0	408	2,745
1992/93	23	160	5.4							305	2,220	74.7	94	535	18.0	10	55	1.9	432	2,970
1993/94	23	160	5.1							315	2,370	75.4	94	555	17.6	10	60	1.9	442	3,145
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		2.3									4.6			5.9			7.2			4.7

Notes: [a] Includes Cominco Ltd. sales requirements starting 1993/94 (30 GW.h).

[b] Includes positive adjustment of 52 GW.h for missed billing during the period 29 December 1980 - 30 November 1981 at Lornex Mine substation.

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TABLE 5-12

COMPOSITION OF TRANSMISSION RATE SALES
HISTORIC & PROBABLE PROJECTIONS
VANCOUVER ISLAND

	PULP & PAPER			WOOD MANUFACTURING			CHEMICALS FOR PULP & PAPER			METAL MINING & SMELTING			COAL MINING							
	-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	----ENERGY----		-PEAK-	-ENERGY-
	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)	% OF TOTAL	(MW)	(GW.H)
HISTORIC																				
1972/73	306	2,163	82.5				13	105	4.0	43	286	10.9				10	67	2.6	372	2,621
1973/74	305	2,202	80.8	6	36	1.3	13	91	3.3	53	353	12.8				11	72	2.6	388	2,754
1974/75	316	2,192	80.8	5	20	0.7	13	104	3.8	55	330	12.2				11	67	2.5	400	2,713
1975/76	313	1,765	76.3	6	17	0.7	13	78	3.4	59	386	16.7				10	68	2.9	401	2,314
1976/77	315	2,321	79.6	6	24	0.8	13	105	3.6	56	399	13.7				11	67	2.3	401	2,916
1977/78	321	2,310	79.4	5	26	0.9	13	91	3.1	58	416	14.3				11	66	2.3	408	2,917
1978/79	339	2,495	80.2	6	26	0.8	12	94	3.0	59	437	14.0				10	61	2.0	426	3,113
1979/80	357	2,494	80.0	6	25	0.8	12	80	2.5	58	448	14.4				16	71	2.3	449	3,118
1980/81	350	2,567	80.2	6	26	0.8	12	91	2.8	60	470	14.7				14	47	1.5	442	3,201
1981/82	382	2,121	78.4	7	22	0.8	12	66	2.4	61	477	17.6				5	20	0.8	467	2,706
1982/83	412	2,164	78.8	7	24	0.9	14	73	2.6	60	465	16.9				5	21	0.8	498	2,747
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/83		0.0						-3.6			5.0						-11.0			0.5
PROJECTIONS																				
1983/84	380	2,350	78.7	7	25	0.8	15	120	4.0	61	470	15.7				6	20	0.7	469	2,985
1984/85	383	2,520	79.4	7	30	0.9	16	130	4.1	61	470	14.8				6	25	0.8	473	3,175
1985/86	403	2,650	80.2	7	30	0.9	16	130	3.9	61	470	14.2				6	25	0.8	493	3,305
1986/87	403	2,650	79.9	8	35	1.1	16	130	3.9	61	470	14.2				7	30	0.9	495	3,315
1987/88	403	2,650	79.8	8	35	1.1	16	130	3.9	61	470	14.2	2	5	0.2	7	30	0.9	497	3,320
1988/89	405	2,700	78.1	8	35	1.0	16	130	3.8	67	520	15.1	6	30	0.9	11	48	1.2	513	3,455
1989/90	410	2,730	78.0	8	35	1.0	17	135	3.9	67	520	14.9	6	30	0.9	13	50	1.4	521	3,500
1990/91	420	2,800	78.2	8	35	1.0	17	135	3.8	67	520	14.5	6	30	0.8	14	60	1.7	532	3,580
1991/92	437	2,910	78.8	8	35	0.9	17	135	3.7	67	520	14.1	6	30	0.8	15	65	1.8	550	3,695
1992/93	455	3,030	79.4	8	35	0.9	17	135	3.5	67	520	13.6	6	30	0.8	15	65	1.7	568	3,815
1993/94	473	3,150	80.1	8	35	0.9	17	135	3.4	67	520	13.2	6	30	0.8	15	65	1.7	586	3,935
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94		3.5			3.5			5.7			1.0						10.8			3.3

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TABLE B-13
PAGE 1 OF 2

TRANSMISSION RATE (3000 SERIES) ACCOUNTS RETAIL - PROBABLE ELECTRIC PROJECTED SALES
(No allowance included for any losses)

NAME OF ACCOUNT	SIC[a]	1982/83 Actual		1983/84		1988/89		1998/99	
		Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
LOWER MAINLAND DIVISION									
1. Canadian Forest Products Ltd. (Chemainus)	2510	6.9	23.7	7	25	7	25	8	30
2. Crown Zellerbach Canada Ltd. (Fraser Mills)	2510	9.1	18.8	10	35	10	40	10	45
3. Canadian Forest Products Ltd. (Pacific Veneer)	2520	11.7	85.4	12	80	12	85	12	70
4. MacMillan Bloedel Ltd. (Vancouver Plywood)	2520	12.1[b]	46.9	12	45	13	50	13	55
5. MacMillan Bloedel Ltd. (Powell River)	2710	99.3[b]	430.9	100	520	100	585	100	615
6. Canadian Forest Products Ltd. (Port Mellon)	2710	15.1	76.9	15	90	15	100	17	115
7. Bolkin Paperboard Ltd.	2710	16.2	98.0	17	110	17	120	19	130
8. MacMillan Bloedel Ltd. (Island Paper Mill)	2710	4.8	25.5	7	40	8	50	6	65
9. Scott Paper Ltd.	2710	12.6	87.9	13	100	21	150	22	165
10. Repanier Canada (B. C.) Ltd. (Woodfibre)	2710	11.9	46.2	13	50	13	75	15	100
11. Canada Cement Lafarge Ltd. (Richmond)	3520	6.7	35.0	7	35	7	40	9	45
12. Inland Cement Industries Ltd. (Delta)	3520	17.0	86.9	17	90	17	90	17	95
13. Fibreglas Canada Ltd. (Abbotsford)	3690	11.5	66.1	11	65	12	70	12	80
14. Chevron Canada Ltd.	3690	6.7	48.8	7	50	8	55	8	60
15. Gulf Oil Canada Ltd.	3690	7.5	50.8	8	55	8	55	8	55
16. Imperial Oil Enterprises Ltd.	3690	11.0	84.3	11	85	11	85	11	85
17. Shell Oil Company of Canada Ltd.	3690	6.3	46.4	6	45	7	50	7	50
18. Canadian Occidental Petroleum Ltd.	3780	57.2	335.7	57	380	57	430	60	440
19. ERCO Industries Ltd.	3780	39.7	264.7	42	300	53	380	54	390
20. FMC of Canada Ltd.	3780	25.4	160.1	30	180	33	215	33	230
21. Hooker Chemicals (Nanaimo) Ltd. (Squamish)	3780	10.4	58.3	10	60	10	70	10	70
22. Westshore Terminals (Roberts Bank)	5080	-	-	-	-	4	10	4	10
23. Saskatchewan Wheat Pool	5260	5.0	25.6	5	25	5	25	5	25
24. Pioneer Grain	5260	3.8	8.2	4	20	4	20	4	20
25. University of British Columbia	8060	28.9	166.3	29	165	29	165	30	170
TOTAL: LOWER MAINLAND DIVISION		438.0	2 322.4	450	2 590	481	2 950	486	3 165
CENTRAL INTERIOR DIVISION									
1. Noranda Mines Limited (Bell Copper)[c]	0580	16.3	51.8	-	-	-	-	10	60
2. Noranda Mines Limited (Granisle)[c]	0580	13.7	25.8	-	-	-	-	-	-
3. Noranda Mines Limited (Boss Mountain)[c]	0580	4.7	15.7	-	-	-	-	-	-
4. Placer Development Ltd.	0580	18.3	37.6	3	20	15	100	20	150
5. Gibraltar Mines Ltd.	0580	27.5	193.1	28	200	28	200	28	200
6. Teck Mining Corporation - Bullmoose Property	0610	-	-	6	20	7	35	7	40
7. Denison Mines Ltd. (Quintette)	0610	-	-	6	20	12	75	20	120
8. Plateau Mills Ltd.	2510	4.5	19.6	5	20	5	20	5	20
9. Takla Forest Products Ltd.	2510	5.6	22.2	5	20	6	25	6	25
10. Fraser Lake Sawmills	2510	6.5	22.1	6	25	6	25	6	25
11. Northwood Pulp and Timber Ltd.	2710	14.0[b]	58.7	14	65	14	70	14	70
12. Intercontinental Pulp Company Ltd.	2710	24.2	162.7	23	165	24	170	25	175
13. Prince George Pulp and Paper Ltd.	2710	32.1	223.0	33	225	33	280	35	220
14. Finlay Forest Industries Ltd.	2710	46.5	275.7	48	290	48	310	48	320
15. British Columbia Forest Products Ltd. (Mackenzie)	2710	13.5	60.6	13	55	13	70	13	75
16. Quesnel River Pulp and Paper (T.N.P.)	2710	56.2	254.0	51	320	51	330	51	340
17. Petro Canada Exploration Inc. (Taylor)	3650	6.5	18.8	6	25	6	25	6	25
18. Texaco Canada Inc. (Boundary Lake)	3650	5.6	23.0	6	40	6	40	6	40
19. B. C. Chemicals Ltd.	3780	25.0	126.2	23	160	25	175	25	180
20. B. C. Railway Electrification	5030	-	-	2	Trace	10	5	10	10
TOTAL: CENTRAL INTERIOR DIVISION		320.7	1 590.6	278	1 670	309	1 935	335	2 145

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TABLE S-13
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TRANSMISSION RATE (3000 SERIES) ACCOUNTS DETAIL - PROBABLE ELECTRIC PROJECTED SALES
(No efficiency factor(s) for any losses)

NAME OF ACCOUNT	SIC[a]	1982/83 Actual Peak MW	1982/83 Actual Energy GW.h	1983/84 Peak[c] MW	1983/84 Energy GW.h	1984/85 Peak[c] MW	1984/85 Energy GW.h	1985/86 Peak[c] MW	1985/86 Energy GW.h
NORTH COAST DIVISION									
1. Equity Silver Mines Ltd.	0690	9.9	67.9	10	75	11	80	12	90
2. Amax of Canada Ltd.[y]	0690	11.7	38.1	-	-	12	40	12	90
3. Northwood Pulp & Timber Ltd. (Houston)	2510	7.0	23.4	7	25	7	30	8	35
4. B. C. Timber (Prince Rupert)	2710	15.0[b]	84.5	15	75	15	85	15	95
5. Eurocan Pulp & Paper Co. Ltd. (Kitimat)	2710	51.8	311.7	55	345	55	365	55	385
6. Prince Rupert Grain Terminal (Ridley Island)	5240	-	-	-	-	-	-	5	15
7. Ridley Island Terminal	5240	-	-	-	Trace	10	5	10	10
TOTAL: NORTH COAST DIVISION		95.4	485.6	87	520	110	605	117	720
SOUTH INTERIOR DIVISION									
1. Afton Mines Ltd.	0690	17.0	31.2	17	115	17	115	17	115
2. Bethlehem Copper Corporation Ltd.	0690	19.9	71.6	22	170	22	170	24	180
3. Lornex Mining Corporation Ltd.	0690	67.3	386.4[d]	67	520	67	520	67	520
4. Lornex Mining Corporation Ltd. - LL Dam	0690	11.2	63.2	11	65	11	65	11	65
5. Craigmont Mines Ltd.	0690	4.5	20.8	-	-	-	-	-	-
6. Neumont Mines Ltd.	0690	33.9	260.0	35	260	35	260	35	260
7. Highmont Operating Corporation	0690	34.1	253.4	35	260	35	260	35	260
8. Bronda Mines Ltd.	0690	27.8	188.4	28	165	28	190	28	210
9. Noranda Mines Limited (Goldstream)	0690	-	-	6	30	6	30	6	30
10. B. C. Coal Ltd. (Natal II)	0610	34.1	148.8	34	135	34	140	34	140
11. B. C. Coal Ltd. (Green Hills)	0610	-	-	10	20	10	35	10	40
12. Fording Coal Ltd.	0610	20.8	132.7	21	120	21	125	21	140
13. Crowsnest Resources Ltd: Line Creek	0610	7.6	12.2	8	35	8	45	8	50
14. Weyerhaeuser Canada Ltd.	2710	21.1[b]	124.0	21	130	21	140	22	150
15. Canada Cement Lafarge Ltd. (Kamloops)	3520	5.8	28.0	6	30	6	30	6	30
16. Trans Mountain Oil (Kamloops)	3650	-	-	4	5	4	20	4	20
TOTAL: SOUTH INTERIOR DIVISION		305.1	1 890.7	325	2 060	325	2 145	328	2 210
VANCOUVER ISLAND DIVISION									
1. Utah Mines Ltd.	0590	59.9	464.8	61	470	61	470	61	470
2. Tahsis Company Ltd. (Sawmill)	2510	7.2	23.5	7	25	7	30	7	30
3. MacMillan Bloedel Limited - Harmac	2710	21.5[b]	119.1	22	130	22	140	22	150
4. MacMillan Bloedel Limited (Port Alberni)	2710	108.5	476.0	106	600	109	650	109	690
5. British Columbia Forest Products Limited (Crofton)	2710	122.5	668.1	120	760	120	800	120	840
6. Crown Zellerbach Canada Limited (Duncan Bay)	2710	135.4[b]	815.6	115	800	115	870	135	910
7. Tahsis Company Ltd. - Gold River	2710	23.7	85.5	17	60	17	60	17	60
8. CanadianOxy Chemicals Ltd. (Harmac)	3720	14.1	73.1	15	120	16	130	16	130
9. Government of Canada - DND Esquimalt	9020	5.3	21.4	6	20	6	25	6	25
TOTAL: VANCOUVER ISLAND DIVISION		498.1	2 747.1	469	2 985	473	3 175	493	3 305
TOTAL - B. C. HYDRO TRANSMISSION RATE SALES		1 657.3	9 046.4	1 609	9 825	1 698	10 810	1 769	11 545

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NOTES FOR TABLE 5-13

[a] SIC Classification* of Accounts by Major Group Title

0590	Metal Mines
0610	Mineral Fuels
2510	Wood Industries
2520	Wood Industries
2710	Pulp and Paper Mills
3520	Non-Metallic Mineral Products Industries
3590	Non-Metallic Mineral Products Industries
3650	Petroleum and Coal Products Industries
3780	Chemical and Chemical Products Industries
5030	Transportation
5050	Transportation
5240	Storage
8060	Education and Related Services
9020	Federal Administration

* Statistics Canada, "Standard Industrial Classification Manual" revised 1970.

[b] Customer took "AD HOC" power at various times which is included in GW.h consumption. However the "Actual" peak shown is the normal peak assuming no "AD HOC" purchased.

[c] Noranda Mines Limited (Bell Copper) and (Granisle) transferred to General Rate 31 October 1982; (Boss Mountain) transferred to General Rate May 1983.

Amax of Canada Ltd. final transfer to General Rate as of 31 March 1983. Craigmont Mines Ltd. transferred to General Rate 28 January 1983 - operations at Craigmont winding down.

[d] Lornex Mining had metering discrepancies from 29 December 1980 to 30 November 1981. Adjustment to the account was included in Fiscal Year 1982/83 and therefore reflects an inflated annual consumption for that fiscal period.

PART SIX

ELECTRIC-PROBABLE OTHER, WKP&L AND SEATTLE CITY LIGHT SALES

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PART SIX

ELECTRIC-PROBABLE OTHER, WKP&L AND SEATTLE CITY LIGHT SALES

6.1 Introduction

This section encompasses sales that are not contained in the residential, general and transmission rate categories. Specifically, sales to other small rate categories, West Kootenay Power and Light and Seattle City Light are included.

6.2 Other Sales

The Other sales, representing mostly smaller rate categories, accounted for just over 2% of total sales in 1982/83. This percentage is projected to decrease marginally through the forecast period. See TABLE 6-1 for historical and projected sales at a total Hydro level and Tables 6-2 through 6-6 for details by Division. Discussion of categories and their forecast methodology follow.

6.2.1 Irrigation

Irrigation requirements are estimated to increase from 47 GW.h in 1982/83 to 74 GW.h in 1993/94. Growth is related to the agriculture component of GDP as contained in the Long Term Economic Outlook (LTEO).

6.2.2 Street Lighting

Street Lighting requirements are estimated to increase from 228 GW.h in 1982/83 to 283 GW.h in 1993/94. The forecast is related to population and the moderate growth reflects the greater use of High Pressure Sodium (HPS) lights with their higher efficiency than mercury vapour lights.

6.2.3 Inter-utility

Inter-utility sales (excluding WKP&L) are largely to New Westminster (97+%) and are estimated to increase from 233 GW.h in 1982/83 to 338 GW.h in 1993/94. The growth allows for proposed future redevelopment including the old B. C. penitentiary site.

6.2.4 Firm Export

Firm exports (excluding Seattle City Light), largely to Point Roberts, Washington, are estimated to increase from 13 GW.h in 1982/83 to 21 GW.h in 1993/94.

6.2.5 B. C. Hydro Own Use

Own use is estimated to increase from 99 GW.h in 1982/83 to 120 GW.h in 1993/94. This moderate growth is due to B. C. Hydro's ongoing programs of consolidation and conservation as well as the lower overall growth rate seen for the company.

B.C. HYDRO

TABLE 6-1

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
TOTAL HYDRO

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	2,159	47	7.6	228	36.8	7	233	37.6	2	13	2.1	931	99	15.9	3,099	620
PROJECTIONS																
1983/84	2,271	49	7.7	232	36.7	7	238	37.6	2	14	2.2	889	100	15.8	3,169	633
1984/85	2,369	51	7.9	237	36.7	7	242	37.5	2	14	2.2	870	101	15.7	3,248	645
1985/86	2,454	54	8.2	242	36.6	7	247	37.4	2	15	2.3	862	103	15.6	3,325	661
1986/87	2,536	56	8.2	247	36.3	7	257	37.8	2	15	2.2	866	105	15.4	3,411	680
1987/88	2,612	58	8.3	252	36.0	7	267	38.1	2	16	2.3	872	107	15.3	3,493	700
1988/89	2,693	61	8.4	257	35.6	8	278	38.5	2	17	2.4	879	109	15.1	3,582	722
1989/90	2,774	63	8.5	262	35.3	8	289	38.9	2	18	2.4	887	111	14.9	3,671	743
1990/91	2,857	66	8.6	267	34.9	8	301	39.3	2	19	2.5	896	113	14.8	3,763	766
1991/92	2,943	68	8.6	272	34.5	8	313	39.7	2	19	2.4	908	116	14.7	3,861	788
1992/93	3,029	71	8.7	278	34.2	8	325	40.0	2	20	2.5	917	118	14.5	3,956	812
1993/94	3,117	74	8.9	283	33.9	8	338	40.4	2	21	2.5	929	120	14.4	4,056	836
2003/04		99	9.2	345	32.1		454	42.2		31	2.9		146	13.6		1,075
AVG. ANNUAL GROWTH (%)																
11 YEARS 82/83-93/94	3.4	4.2		2.0	-0.7		3.4	0.7		4.5	1.7		1.8	-1.0		2.8
10 YEARS 93/94-03/04		3.0		2.0	-0.5		3.0	0.4		4.0	1.4		2.0	-0.5		2.5

B.C. HYDRO

TABLE 6-2

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
LOWER MAINLAND

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	326	3	0.7	135	30.7	1	228	51.8	1	13	3.0	503	61	13.9	831	440
PROJECTIONS																
1983/84	352	3	0.7	138	30.7	1	233	51.9	1	14	3.1	502	61	13.6	856	449
1984/85	376	3	0.7	141	30.9	1	236	51.6	1	14	3.1	500	63	13.8	878	457
1985/86	386	3	0.6	144	30.7	1	241	51.4	1	15	3.2	502	66	14.1	890	469
1986/87	398	3	0.6	147	30.3	1	251	51.8	1	15	3.1	504	69	14.2	904	485
1987/88	413	4	0.8	150	29.9	1	261	52.1	1	16	3.2	507	70	14.0	922	501
1988/89	428	4	0.8	152	29.5	1	271	52.5	1	17	3.3	510	72	14.0	940	516
1989/90	443	4	0.8	155	29.1	1	282	53.0	1	18	3.4	513	73	13.7	958	532
1990/91	458	5	0.9	158	28.7	1	294	53.5	1	19	3.5	518	74	13.5	978	550
1991/92	473	5	0.9	161	28.4	1	306	54.0	1	19	3.4	523	76	13.4	998	567
1992/93	488	5	0.9	163	28.0	1	317	54.4	1	20	3.4	528	78	13.4	1,018	583
1993/94	503	5	0.8	166	27.6	1	330	54.9	1	21	3.5	533	79	13.1	1,038	601
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	4.0	4.8		1.9	-1.0		3.4	0.5		4.5	1.5		2.4	-0.5		2.9

B.C. HYDRO

TABLE 6-3

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
CENTRAL INTERIOR

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	179	3	8.8	20	58.8	6	5	14.7				114	6	17.6	299	34
PROJECTIONS																
1983/84	192	4	11.1	20	55.6	6	5	13.9				106	7	19.4	304	36
1984/85	207	4	10.5	21	55.3	6	6	15.8				106	7	18.4	319	38
1985/86	220	5	12.8	21	53.8	6	6	15.4				106	7	17.9	332	39
1986/87	231	5	12.5	22	55.0	6	6	15.0				108	7	17.5	345	40
1987/88	240	5	12.2	22	53.7	6	6	14.6				110	8	19.5	356	41
1988/89	250	5	11.6	23	53.5	7	7	16.3				112	8	18.6	369	43
1989/90	260	6	13.6	23	52.3	7	7	15.9				114	8	18.2	381	44
1990/91	270	6	13.3	24	53.3	7	7	15.6				116	8	17.8	393	45
1991/92	280	6	13.0	24	52.2	7	7	15.2				119	9	19.6	406	46
1992/93	290	6	12.5	25	52.1	7	8	16.7				121	9	18.8	418	48
1993/94	300	6	12.5	25	52.1	7	8	16.7				124	9	18.8	431	48
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	4.8	6.5		2.0	-1.1		4.4	1.1					3.8	0.6		3.2

B.C. HYDRO

TABLE 6-4

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
NORTH COAST

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	1			8	72.7				1			33	3	27.3	35	11
PROJECTIONS																
1983/84				8	72.7				1			32	3	27.3	33	11
1984/85				8	72.7				1			32	3	27.3	33	11
1985/86				9	75.0				1			32	3	25.0	33	12
1986/87	1			9	75.0				1			32	3	25.0	34	12
1987/88	1			9	75.0				1			33	3	25.0	35	12
1988/89	2			10	76.9				1			33	3	23.1	36	13
1989/90	2			10	71.4				1			34	4	28.6	37	14
1990/91	2			10	71.4				1			34	4	28.6	37	14
1991/92	3			10	71.4				1			35	4	28.6	39	14
1992/93	3			11	73.3				1			35	4	26.7	39	15
1993/94	3			11	73.3				1			36	4	26.7	40	15
2003/04																
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	10.5			2.9	0.1								2.6	-0.2		2.9

B.C. HYDRO

TABLE 6-5

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
SOUTH INTERIOR

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	1,379	37	43.0	26	30.2							227	23	26.8	1,606	86
PROJECTIONS																
1983/84	1,446	39	44.8	26	29.9							195	22	25.3	1,641	87
1984/85	1,501	41	46.1	27	30.3							179	21	23.6	1,680	89
1985/86	1,558	43	48.3	27	30.3							170	19	21.3	1,728	89
1986/87	1,612	45	49.5	28	30.8							170	18	19.8	1,782	91
1987/88	1,660	46	50.0	28	30.4							170	18	19.6	1,830	92
1988/89	1,710	48	50.5	29	30.5							171	18	18.9	1,881	95
1989/90	1,761	49	50.5	30	30.9							173	18	18.6	1,934	97
1990/91	1,814	51	51.5	30	30.3							175	18	18.2	1,989	99
1991/92	1,869	53	52.0	31	30.4							177	18	17.6	2,046	102
1992/93	1,925	56	52.8	32	30.2							179	18	17.0	2,104	106
1993/94	1,983	59	53.2	33	29.7							181	19	17.1	2,164	111
2003/04																
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	3.4	4.3		2.2	-0.2								-1.7	-4.8		2.3

B.C. HYDRO

TABLE 6-6

COMPOSITION OF OTHER SALES
HISTORIC & PROBABLE PROJECTIONS
VANCOUVER ISLAND

	IRRIGATION			STREET LTG.		INTER-UTILITY			EXPORT TO USA			BC HYDRO USE			TOTAL	
	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.	% OF TOTAL	AVG NO ACCOUNTS	SALES GW.H.
HISTORIC																
1982/83	274	4	8.2	39	79.6							54	6	12.2	328	49
PROJECTIONS																
1983/84	281	3	6.0	40	80.0							54	7	14.0	335	50
1984/85	285	3	6.0	40	80.0							53	7	14.0	338	50
1985/86	290	3	5.8	41	78.8							52	8	15.4	342	52
1986/87	294	3	5.8	41	78.8							52	8	15.4	346	52
1987/88	298	3	5.6	43	79.6							52	8	14.8	350	54
1988/89	303	4	7.3	43	78.2							53	8	14.5	356	55
1989/90	308	4	7.1	44	78.6							53	8	14.3	361	56
1990/91	313	4	6.9	45	77.6							53	9	15.5	366	58
1991/92	318	4	6.8	46	78.0							54	9	15.3	372	59
1992/93	323	4	6.7	47	78.3							54	9	15.0	377	60
1993/94	328	4	6.6	48	78.7							55	9	14.8	383	61
2003/04																
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	1.6			1.9	-0.1								3.8	1.7		2.0

6.3 West Kootenay Power and Light (WKP&L) Requirements

B. C. Hydro is committed to supply WKP&L under the Kootenay Canal Agreement, essentially resulting in supplying the load growth in the WKP&L system.

WKP&L requirements are estimated to increase from 15 GW.h in 1982/83 to 1 840 GW.h in 1993/94. The forecast is based on the following:

- an estimate of WKP&L load and anticipated requirements supplied by WKP&L. This estimate assumes no significant change to major industrial loads such as Cominco and B. C. Timber thus assuming certain amounts of energy and capacity are available to WKP&L from Cominco;

- a projection of Cominco requirements based on the Mining and Smelting study done by H. N. Halvorson. Halvorson projects expansion and changes to the Cominco smelting operations requiring additional electricity in 1988 and 1995. As well Halvorson projects a ferro-silicon plant to be built in the Cominco area in the 1990-94 period. For this forecast, the 1988 Cominco expansion is assumed to occur in 1991, the 1995 expansion in 1995 and the ferro-silicon plant to commence operation in 1992.

- The Woodbridge, Reed study on the Forest Industry. Based on this report an expansion of the B. C. Timber pulp mill is assumed in the late 1990's.

- a study of the resource/requirements balance of the combined WKP&L and Cominco systems. This study is based on the foregoing load considerations and assumes no additional generation beyond that available at present is provided by WKP&L/Cominco.

- the B. C. Government Order of 28 July 1982 directing Cominco to provide 75 average annual megawatts of energy (650 GW.h) to WKP&L through 31 December 1990.

Details of WKP&L requirements and generation required by B. C. Hydro to meet these requirements are shown on TABLE 6-7.

6.4 Seattle City Light Supply

B. C. Hydro is required to supply Seattle City Light with energy as agreed in the "Skagit Negotiations Framework Agreement". The estimated requirements at Blaine, on a monthly basis and commencing 1 January 1986 for an indefinite period are as shown in TABLE 6-8.

ESTIMATED ANNUAL ELECTRIC LOAD REQUIREMENTS FOR WEST KOOTENAY POWER AND LIGHT CO. LTD. UTILITY SYSTEM TO BE MET BY B. C. HYDRO (Probable Basis)

TABLE 6-7

Fiscal Year	WKP&L Co. Ltd. Requirements		B. C. Hydro generation required to meet requirements (Diversified Peak) (rounded)	
	Peak MW	Energy GW.h	Peak MW	Energy GW.h
1983/84	135	120	130	130
1984/85	180	180	175	190
1985/86	205	260	200	280
1986/87	235	420	230	450
1987/88	265	500	260	540
1988/89	295	660	290	710
1989/90	330	800	320	870
1990/91	365	950	355	1 030
1991/92	410	1 230	400	1 330
1992/93	470	1 560	460	1 690
1993/94	525	1 840	510	1 990
1994/95	560	1 930	545	2 090
1995/96	575	2 020	560	2 190
1996/97	590	2 110	575	2 290
1997/98	635	2 320	620	2 510
1998/99	675	2 500	660	2 710
1999/2000	695	2 600	680	2 820
2000/01	715	2 700	695	2 920
2001/02	730	2 800	710	3 030
2002/03	740	2 910	720	3 150
2003/04	750	3 010	730	3 260

These estimated probable requirements are based on estimates provided by WKP&L; a projection of Cominco requirements based on the Mining and Smelting study done by H. N. Halvorson; the Woodbridge, Reed study on the B. C. Forest Industry; a study of the resource balance and future additional requirements of the combined WKP&L and Cominco systems.

The diversified peak is the peak estimated as having to be supplied by B. C. Hydro generation at the time of the B. C. Hydro integrated system peak. The peak is forecast by adding 8.3% for transmission losses to the estimated WKP&L requirements and then diversifying to 90%. The 90% diversity is to account for expected differences in operation of the two systems.

B. C. Government Order from the Minister of Energy, Mines and Petroleum Resources dated 28 July 1982 directed Cominco Ltd. to provide 75 average annual megawatts of energy to West Kootenay Power and Light Co. Ltd. through 31 December 1990. The substantial increase in energy and peak requirements starting in 1991/92 above, is the replacement of this energy from Cominco with energy from B. C. Hydro. It is projected this 'additional' energy available to Cominco will be utilized in expansion of their operations.

TABLE 6-8

SUPPLY TO SEATTLE CITY LIGHT
UNDER PROPOSED SKAGIT AGREEMENT
- REQUIREMENTS AT BLAINE

Month	Requirements at Blaine Commencing 1 January 1986 Peak MW	Energy GW.h
April	146	20.1
May	146	19.6
June	146	26.8
July	146	18.3
August	146	13.5
September	146	9.6
October	146	14.1
November	166	25.6
December	195	34.5
January	244	44.2
February	262	46.4
March		45.3
		318.0

To determine the B. C. Hydro generation required to meet the requirements at Blaine transmission losses of 8.3% are added. For the peak the January peak of 195 MW is used as this coincides with the normally expected December-January period for peaking of the B. C. Hydro system. Adding 8.3% transmission losses to the 195 MW peak and then diversifying to 90% to allow for some variation in operation of the two systems gives an estimated coincident peak of 190 MW. This 190 MW peak is the expected generation peak on the B. C. Hydro system at the time of the B. C. Hydro integrated system peak.

PART SEVEN

ELECTRIC-PROBABLE TOTAL SALES

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PART SEVEN

ELECTRIC - PROBABLE TOTAL SALES

7.1 Introduction

Total B. C. Hydro electric energy sales are the sum of Residential (Part Three), General (Part Four), Transmission Rate (Part Five), Other, WKP&L and Seattle City Light (Part Six). Figure 7-1 presents a graphical representation of the historical and forecast sales components.

7.2 Total Sales

TABLE 7-1 provides detail of the electric forecast to 1993/94 for accounts, average use per account and electric energy sales by category at the total B. C. Hydro level. TABLES 7-2 through 7-6 provide information in TABLE 7-1 at Divisional level.

Notes: WKP&L requirements are included in Inter-utility in the South Interior Division (and hence carried through to total B. C. Hydro) in these tables.

Seattle City Light requirements are included in Export to USA in the Lower Mainland Division (and hence carried through to total B. C. Hydro) in these tables.

TABLE 7-7 shows historical and forecast sales, average customers and categorical percentage of sales over a 20 year period at the total B. C. Hydro level. TABLES 7-8 through 7-12 provide information in TABLE 7-7 at a Divisional level.

Figure 7-1

HISTORIC AND PROBABLE SALES

TOTAL HYDRO
(GW.h)

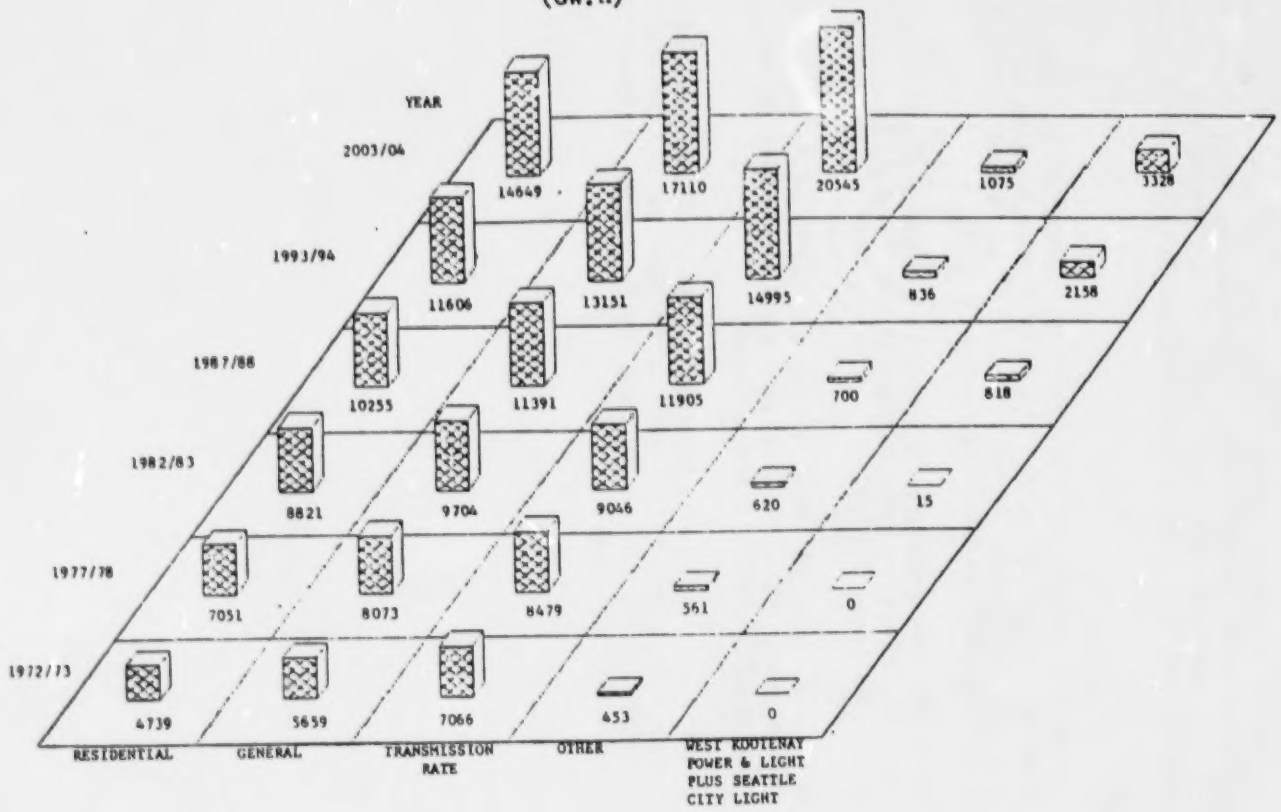

TABLE 7-1

B.C. Hydro

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

Division Total Hydro Location All Divisions Type Probable Date 11 July 1983

DESCRIPTION	ACTUAL 1982/83	FISCAL YEARS PROJECTION 1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
1. NON-HEATING												
ACCOUNTS AT YEAR END	812 447	826 550	840 250	856 380	874 000	892 080	910 910	930 270	949 800	969 500	989 570	1 010 180
AVERAGE ACCOUNTS FOR YEAR	810 099	820 180	832 910	847 560	865 180	882 790	901 340	920 480	940 030	959 530	979 450	999 680
ANNUAL USE PER ACCOUNT — KWH	8 127	8 123	8 118	8 112	8 088	8 064	8 033	7 992	7 939	7 881	7 821	7 771
SALES — GWH	6 584	6 663	6 762	6 875	6 998	7 119	7 240	7 356	7 463	7 562	7 660	7 769
2. HEATING												
ACCOUNTS AT YEAR END	155 307	165 770	179 520	192 720	204 930	217 250	229 580	241 880	254 445	266 070	278 080	290 270
AVERAGE ACCOUNTS FOR YEAR	147 086	159 110	172 400	186 630	198 780	211 050	223 410	235 730	248 010	260 070	272 040	284 080
ANNUAL USE PER ACCOUNT — KWH	15 211	15 922	15 657	15 392	15 113	14 860	14 616	14 380	14 148	13 922	13 700	13 508
SALES — GWH	2 237	2 533	2 699	2 873	3 004	3 136	3 266	3 390	3 509	3 621	3 727	3 837
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	967 754	992 320	1 019 770	1 049 100	1 078 930	1 109 330	1 140 490	1 172 150	1 204 245	1 235 570	1 267 650	1 300 450
AVERAGE ACCOUNTS FOR YEAR	957 185	979 290	1 005 310	1 034 190	1 063 960	1 093 840	1 124 750	1 156 210	1 188 040	1 219 600	1 251 490	1 283 760
ANNUAL USE PER ACCOUNT — KWH	9 216	9 390	9 411	9 426	9 401	9 376	9 341	9 294	9 235	9 169	9 099	9 041
SALES — GWH	8 821	9 196	9 461	9 748	10 002	10 255	10 506	10 746	10 972	11 183	11 387	11 606
GENERAL												
1. GENERAL — UNDER 50 KW												
ACCOUNTS AT YEAR END	117 998	119 030	120 600	122 480	124 460	126 520	128 700	130 980	133 340	135 770	138 270	140 850
AVERAGE ACCOUNTS FOR YEAR	117 617	118 550	119 900	121 540	123 470	125 490	127 610	129 840	132 160	134 555	137 020	139 560
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	2 301	2 324	2 356	2 395	2 440	2 492	2 547	2 607	2 663	2 728	2 795	2 863
2. GENERAL — 50 KW AND OVER												
ACCOUNTS AT YEAR END	14 384	15 080	15 790	16 550	17 310	18 120	18 950	19 800	20 650	21 530	22 430	23 350
AVERAGE ACCOUNTS FOR YEAR	14 071	14 730	15 345	16 170	16 930	17 715	18 535	19 375	20 225	21 090	21 980	22 890
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	7 403	7 642	8 021	8 447	8 716	8 899	9 097	9 295	9 511	9 738	9 972	10 288
TOTAL GENERAL												
ACCOUNTS AT YEAR END	132 382	134 110	136 390	139 030	141 770	144 640	147 650	150 780	153 990	157 300	160 700	164 200
AVERAGE ACCOUNTS FOR YEAR	131 688	133 280	135 245	137 710	140 400	143 205	146 145	149 215	152 385	155 645	159 000	162 450
SALES — GWH	9 704	9 966	10 377	10 842	11 156	11 391	11 644	11 902	12 174	12 466	12 767	13 151
IRRIGATION												
ACCOUNTS AT YEAR END	2 212	2 327	2 409	2 497	2 572	2 651	2 732	2 814	2 898	2 984	3 071	3 160
AVERAGE ACCOUNTS FOR YEAR	2 159	2 271	2 369	2 454	2 536	2 612	2 693	2 774	2 857	2 943	3 029	3 117
SALES — GWH	47	49	51	54	56	58	61	63	66	68	71	74
STREET LIGHTING												
SALES — GWH	228	232	237	242	247	252	257	262	267	272	278	283
TRANSMISSION RATE a												
ACCOUNTS AT YEAR END	65	70	72	74	75	77	80	80	83	85	87	89
AVERAGE ACCOUNTS FOR YEAR	65	70	72	74	75	77	80	80	83	85	87	89
SALES — GWH	9 046	9 825	10 810	11 545	11 830	11 905	12 475	12 835	13 250	13 760	14 415	14 995
INTER-UTILITY b												
ACCOUNTS AT YEAR END	8	8	8	8	8	8	9	9	9	9	9	9
AVERAGE ACCOUNTS FOR YEAR	8	8	8	8	8	8	9	9	9	9	9	9
SALES — GWH	248	358	422	507	677	767	938	1 089	1 251	1 543	1 885	2 178
EXPORT TO U.S.A. c												
ACCOUNTS AT YEAR END	2	2	2	3	3	3	3	3	3	3	3	3
AVERAGE ACCOUNTS FOR YEAR	2	2	2	3	3	3	3	3	3	3	3	3
SALES — GWH	13	14	14	151	333	334	335	336	337	337	338	339
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	902	876	860	863	868	874	882	891	900	912	921	933
AVERAGE ACCOUNTS FOR YEAR	931	889	870	862	866	872	879	887	896	908	917	929
SALES — GWH	99	100	101	103	105	107	109	111	113	116	118	120
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	1 103 325	1 129 713	1 159 511	1 191 575	1 224 226	1 257 583	1 291 846	1 326 727	1 362 128	1 396 863	1 432 441	1 468 846
AVERAGE ACCOUNTS FOR YEAR	1 092 038	1 115 810	1 143 876	1 175 301	1 207 848	1 240 617	1 274 539	1 309 178	1 344 273	1 379 193	1 414 535	1 450 357
SALES — GWH	28 206	29 740	31 473	33 192	34 406	35 069	36 325	37 344	38 430	39 745	41 259	42 746

LOAD FORECAST DEPARTMENT

a Includes Cominco requirements
b Includes West Kootenay Power and Light Co. Ltd. requirements
c Includes Seattle City Light requirements

B.C. Hydro

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

TABLE 7-2

Division Lower Mainland Location Total All Districts Type Probable Date 11 July 1983

DESCRIPTION	ACTUAL 1982/83	FISCAL YEARS PROJECTION 1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
1. NON-HEATING												
ACCOUNTS AT YEAR END	489 375	497 400	506 010	514 970	524 130	533 560	543 340	553 340	563 370	573 440	583 650	594 120
AVERAGE ACCOUNTS FOR YEAR	486 212	493 200	501 600	510 420	519 520	528 730	538 380	548 300	558 370	568 360	578 510	588 790
ANNUAL USE PER ACCOUNT — KWH	7 562	7 565	7 560	7 550	7 540	7 530	7 510	7 485	7 450	7 400	7 360	7 320
SALES — GWH	3 677	3 730	3 792	3 854	3 917	3 981	4 044	4 104	4 159	4 208	4 257	4 310
2. HEATING												
ACCOUNTS AT YEAR END	50 095	54 650	60 660	66 870	73 100	79 270	85 440	91 570	97 625	103 590	109 525	115 520
AVERAGE ACCOUNTS FOR YEAR	46 535	51 700	57 590	63 730	70 010	76 180	82 360	88 510	94 630	100 620	106 560	112 490
ANNUAL USE PER ACCOUNT — KWH	14 011	14 920	14 640	14 365	14 115	13 890	13 715	13 505	13 320	13 150	12 930	12 775
SALES — GWH	652	772	843	915	988	1 058	1 129	1 195	1 260	1 323	1 378	1 437
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	539 470	552 050	566 670	581 840	597 230	612 830	628 780	644 910	660 995	677 030	693 175	709 640
AVERAGE ACCOUNTS FOR YEAR	532 747	544 900	559 190	574 150	589 530	604 910	620 740	636 810	653 000	668 980	685 070	701 280
ANNUAL USE PER ACCOUNT — KWH	8 125	8 263	8 289	8 306	8 321	8 331	8 334	8 322	8 299	8 268	8 225	8 196
SALES — GWH	4 329	4 502	4 635	4 769	4 905	5 039	5 173	5 299	5 419	5 531	5 635	5 747
GENERAL												
1. GENERAL — UNDER 35 KW												
ACCOUNTS AT YEAR END	64 496	64 760	65 450	66 400	67 370	68 350	69 350	70 370	71 400	72 450	73 530	74 630
AVERAGE ACCOUNTS FOR YEAR	64 273	64 640	65 150	65 925	66 885	67 860	68 850	69 860	70 885	71 925	72 990	74 080
ANNUAL USE PER ACCOUNT — KWH	19 754	19 258	19 270	19 288	19 310	19 334	19 360	19 387	19 408	19 436	19 465	19 494
SALES — GWH	1 254	1 238	1 270	1 288	1 310	1 334	1 360	1 387	1 408	1 436	1 465	1 494
2. GENERAL — 35 KW AND OVER												
ACCOUNTS AT YEAR END	7 555	7 880	8 220	8 600	8 980	9 380	9 790	10 200	10 610	11 020	11 440	11 860
AVERAGE ACCOUNTS FOR YEAR	7 373	7 710	8 005	8 410	8 790	9 180	9 585	9 995	10 405	10 815	11 230	11 650
ANNUAL USE PER ACCOUNT — KWH	582	561	548	531	527	516	507	487	474	460	448	436
SALES — GWH	4 290	4 386	4 597	4 827	4 981	5 067	5 166	5 267	5 370	5 494	5 593	5 767
TOTAL GENERAL												
ACCOUNTS AT YEAR END	72 051	72 640	73 670	75 000	76 350	77 730	79 140	80 570	82 010	83 470	84 970	86 490
AVERAGE ACCOUNTS FOR YEAR	71 646	72 350	73 155	74 335	75 675	77 040	78 435	79 855	81 290	82 740	84 220	85 730
SALES — GWH	5 544	5 644	5 867	6 115	6 291	6 401	6 526	6 654	6 778	6 930	7 058	7 261
IRRIGATION												
ACCOUNTS AT YEAR END	332	371	381	391	405	420	435	450	465	480	495	510
AVERAGE ACCOUNTS FOR YEAR	326	352	376	386	398	413	428	443	458	473	488	503
SALES — GWH	3	3	3	3	3	4	4	4	5	5	5	5
STREET LIGHTING												
SALES — GWH	135	138	141	144	147	150	152	155	158	161	163	166
TRANSMISSION RATE												
ACCOUNTS AT YEAR END	24	24	25	25	25	25	25	25	25	27	27	27
AVERAGE ACCOUNTS FOR YEAR	24	24	25	25	25	25	25	25	25	27	27	27
SALES — GWH	2 322	2 590	2 950	3 165	3 185	3 200	3 315	3 365	3 430	3 500	3 610	3 685
INTER-UTILITY												
ACCOUNTS AT YEAR END	1	1	1	1	1	1	1	1	1	1	1	1
AVERAGE ACCOUNTS FOR YEAR	1	1	1	1	1	1	1	1	1	1	1	1
SALES — GWH	228	233	236	241	251	261	271	282	294	306	317	330
EXPORT TO U.S.A. a												
ACCOUNTS AT YEAR END	1	1	1	2	2	2	2	2	2	2	2	2
AVERAGE ACCOUNTS FOR YEAR	1	1	1	2	2	2	2	2	2	2	2	2
SALES — GWH	13	14	14	151	333	334	335	336	337	337	338	339
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	505	499	500	503	505	508	511	515	520	525	530	535
AVERAGE ACCOUNTS FOR YEAR	503	502	500	502	504	507	510	513	518	523	528	533
SALES — GWH	61	61	63	66	69	70	72	73	74	76	78	79
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	612 384	625 586	641 248	657 762	674 518	691 516	708 894	726 473	744 018	761 535	779 200	797 205
AVERAGE ACCOUNTS FOR YEAR	605 248	618 130	633 248	649 401	666 135	682 898	700 141	717 649	735 294	752 746	770 336	788 076
SALES — GWH	12 635	13 185	13 909	14 654	15 184	15 459	15 848	16 168	16 495	16 846	17 204	17 612

a Includes Seattle City Light requirements

LOAD FORECAST DEPARTMENT

BC Hydro

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

Division: Central Interior Location: Total All Districts Type: Probable Date: 11 July 1983

DESCRIPTION	ACTUAL 1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
	FISCAL YEARS	PROJECTION										
RESIDENTIAL												
1. NON-HEATING												
ACCOUNTS AT YEAR END	70 195	72 480	74 440	76 550	78 720	80 980	83 340	85 780	88 250	90 750	93 300	95 890
AVERAGE ACCOUNTS FOR YEAR	70 197	71 550	73 410	75 470	77 620	79 820	82 140	84 540	87 010	89 480	92 020	94 580
ANNUAL USE PER ACCOUNT — KWH	9 154	9 150	9 150	9 150	9 150	9 150	9 140	9 120	9 090	9 060	9 020	8 995
SALES — GWH	642	655	672	690	710	731	751	771	791	811	830	851
2. HEATING												
ACCOUNTS AT YEAR END	10 963	11 390	12 070	12 740	13 400	14 050	14 690	15 310	15 930	16 530	17 150	17 810
AVERAGE ACCOUNTS FOR YEAR	10 333	11 040	11 740	12 400	13 070	13 720	14 370	15 000	15 620	16 230	16 830	17 460
ANNUAL USE PER ACCOUNT — KWH	16 788	17 660	17 220	16 835	16 475	16 140	15 820	15 515	15 215	14 905	14 650	14 400
SALES — GWH	174	195	202	209	216	221	227	233	238	241	247	251
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	81 158	83 870	86 510	89 290	92 120	95 030	98 030	101 090	104 180	107 280	110 450	113 700
AVERAGE ACCOUNTS FOR YEAR	80 530	82 590	85 150	87 870	90 690	93 540	96 510	99 540	102 630	105 710	108 850	112 040
ANNUAL USE PER ACCOUNT — KWH	10 134	10 288	10 263	10 234	10 206	10 175	10 135	10 084	10 022	9 936	9 890	9 837
SALES — GWH	816	850	874	899	926	952	978	1 004	1 029	1 052	1 077	1 102
GENERAL												
1. GENERAL — UNDER 35 KW												
ACCOUNTS AT YEAR END	10 731	10 920	11 100	11 310	11 530	11 750	12 010	12 280	12 550	12 830	13 110	13 400
AVERAGE ACCOUNTS FOR YEAR	10 707	10 830	11 020	11 205	11 420	11 640	11 880	12 145	12 415	12 690	12 970	13 255
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	225	233	239	245	252	260	267	276	284	293	302	311
2. GENERAL — 35 KW AND OVER												
ACCOUNTS AT YEAR END	1 551	1 630	1 710	1 800	1 890	1 990	2 090	2 190	2 290	2 390	2 490	2 600
AVERAGE ACCOUNTS FOR YEAR	1 514	1 590	1 660	1 755	1 845	1 940	2 040	2 140	2 240	2 340	2 440	2 545
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	990	1 046	1 099	1 160	1 199	1 232	1 265	1 299	1 337	1 371	1 410	1 453
TOTAL GENERAL												
ACCOUNTS AT YEAR END	12 282	12 550	12 810	13 110	13 420	13 740	14 100	14 470	14 840	15 220	15 600	16 000
AVERAGE ACCOUNTS FOR YEAR	12 221	12 420	12 680	12 960	13 265	13 580	13 920	14 285	14 655	15 030	15 410	15 800
SALES — GWH	1 215	1 279	1 338	1 405	1 451	1 492	1 532	1 575	1 621	1 664	1 712	1 764
IRRIGATION												
ACCOUNTS AT YEAR END	183	200	213	226	235	245	255	265	275	285	295	305
AVERAGE ACCOUNTS FOR YEAR	179	192	207	220	231	240	250	260	270	280	290	300
SALES — GWH	3	4	4	5	5	5	5	6	6	6	6	6
STREET LIGHTING												
SALES — GWH	20	20	21	21	22	22	23	23	24	24	25	25
TRANSMISSION RATE												
ACCOUNTS AT YEAR END	15	17	17	18	19	20	21	21	22	22	23	24
AVERAGE ACCOUNTS FOR YEAR	15	17	17	18	19	20	21	21	22	22	23	24
SALES — GWH	1 591	1 670	1 935	2 145	2 255	2 310	2 465	2 675	2 860	3 060	3 255	3 455
INTERAUTILITY												
ACCOUNTS AT YEAR END	6	6	6	6	6	6	7	7	7	7	7	7
AVERAGE ACCOUNTS FOR YEAR	6	6	6	6	6	6	7	7	7	7	7	7
SALES — GWH	5	5	6	6	6	6	7	7	7	7	8	8
EXPORT TO U.S.A.												
ACCOUNTS AT YEAR END	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE ACCOUNTS FOR YEAR	-	-	-	-	-	-	-	-	-	-	-	-
SALES — GWH	-	-	-	-	-	-	-	-	-	-	-	-
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	105	106	105	107	109	111	113	115	117	120	122	125
AVERAGE ACCOUNTS FOR YEAR	114	106	106	106	108	110	112	114	116	119	121	124
SALES — GWH	6	7	7	7	7	8	8	8	8	9	9	9
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	93 749	96 749	99 661	102 757	105 909	109 152	112 526	115 968	119 461	122 934	126 497	130 161
AVERAGE ACCOUNTS FOR YEAR	93 065	95 331	98 166	101 180	104 319	107 496	110 820	114 227	117 700	121 168	124 701	128 295
SALES — GWH	3 656	3 835	4 185	4 488	4 672	4 795	5 018	5 298	5 555	5 822	6 092	6 369

LOAD FORECAST DEPARTMENT

BC Hydro

TABLE 7-4

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

Division North Coast Location Total All Districts Type Probable Date 11 July 1983

DESCRIPTION	ACTUAL 1982/83	FISCAL YEARS PROJECTION 1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
1. [illegible]												
ACCOUNTS AT YEAR END	20 699	21 290	21 850	22 520	23 210	23 910	24 620	25 350	26 070	26 800	27 530	28 270
AVERAGE ACCOUNTS FOR YEAR	20 629	21 060	21 510	22 180	22 860	23 550	24 260	24 980	25 710	26 430	27 160	27 890
ANNUAL USE PER ACCOUNT — KWH	10 317	10 315	10 310	10 310	10 310	10 310	10 300	10 275	10 240	10 195	10 145	10 110
SALES — GWH	213	218	221	229	236	243	250	257	263	270	276	282
2. [illegible]												
ACCOUNTS AT YEAR END	6 986	7 030	7 270	7 560	7 850	8 150	8 460	8 790	9 120	9 470	9 820	10 180
AVERAGE ACCOUNTS FOR YEAR	6 797	6 920	7 130	7 410	7 700	7 990	8 300	8 620	8 950	9 290	9 640	9 990
ANNUAL USE PER ACCOUNT — KWH	18 115	18 835	18 615	18 360	18 115	17 880	17 645	17 415	17 175	16 945	16 720	16 510
SALES — GWH	123	130	133	136	139	143	146	150	154	157	161	165
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	27 685	28 320	29 120	30 080	31 060	32 060	33 080	34 140	35 190	36 270	37 350	38 450
AVERAGE ACCOUNTS FOR YEAR	27 426	27 980	28 640	29 590	30 560	31 540	32 560	33 600	34 660	35 720	36 800	37 880
ANNUAL USE PER ACCOUNT — KWH	12 250	12 422	12 378	12 366	12 277	12 228	12 172	12 107	12 031	11 951	11 867	11 798
SALES — GWH	336	348	354	365	375	386	396	407	417	427	437	447
GENERAL												
1. [illegible]												
ACCOUNTS AT YEAR END	4 432	4 520	4 600	4 680	4 760	4 850	4 950	5 060	5 190	5 320	5 450	5 590
AVERAGE ACCOUNTS FOR YEAR	4 442	4 480	4 560	4 640	4 720	4 805	4 900	5 005	5 125	5 255	5 385	5 520
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	91	93	95	97	99	101	103	105	108	110	113	116
2. [illegible]												
ACCOUNTS AT YEAR END	547	570	600	630	660	690	730	770	810	860	910	960
AVERAGE ACCOUNTS FOR YEAR	543	560	585	615	645	675	710	750	790	835	885	935
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	247	285	299	314	324	333	342	357	369	380	397	412
TOTAL GENERAL												
ACCOUNTS AT YEAR END	4 979	5 090	5 200	5 310	5 420	5 540	5 680	5 830	6 000	6 180	6 360	6 550
AVERAGE ACCOUNTS FOR YEAR	4 985	5 040	5 145	5 255	5 365	5 480	5 610	5 755	5 915	6 090	6 270	6 455
SALES — GWH	338	378	394	411	423	434	445	462	477	490	510	528
IRRIGATION												
ACCOUNTS AT YEAR END	1	0	0	0	1	1	2	2	2	3	3	3
AVERAGE ACCOUNTS FOR YEAR	1	0	0	0	1	1	2	2	2	3	3	3
SALES — GWH	-	-	-	-	T	T	T	T	T	T	T	T
STREET LIGHTING												
SALES — GWH	8	8	8	9	9	9	10	10	10	10	11	11
TRANSMISSION RATE												
ACCOUNTS AT YEAR END	5	5	6	7	7	7	8	8	8	8	8	8
AVERAGE ACCOUNTS FOR YEAR	5	5	6	7	7	7	8	8	8	8	8	8
SALES — GWH	495	520	605	720	730	730	760	760	760	760	765	775
INTER-UTILITY												
ACCOUNTS AT YEAR END	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE ACCOUNTS FOR YEAR	-	-	-	-	-	-	-	-	-	-	-	-
SALES — GWH	-	-	-	-	-	-	-	-	-	-	-	-
EXPORT TO U.S.A.												
ACCOUNTS AT YEAR END	1	1	1	1	1	1	1	1	1	1	1	1
AVERAGE ACCOUNTS FOR YEAR	1	1	1	1	1	1	1	1	1	1	1	1
SALES — GWH	T	T	T	T	T	T	T	T	T	T	T	T
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	33	32	32	32	32	33	33	34	34	35	35	36
AVERAGE ACCOUNTS FOR YEAR	33	32	32	32	32	33	33	34	34	35	35	36
SALES — GWH	3	3	3	3	3	3	3	4	4	4	4	4
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	32 704	33 448	34 359	35 430	36 521	37 642	38 804	40 015	41 235	42 497	43 757	45 068
AVERAGE ACCOUNTS FOR YEAR	32 451	33 058	33 824	34 885	35 966	37 062	38 214	39 400	40 620	41 857	43 117	44 383
SALES — GWH	1 180	1 257	1 364	1 508	1 540	1 562	1 614	1 643	1 668	1 691	1 727	1 765

T - Trace

LOAD FORECAST DEPARTMENT

TABLE 7-5

B.C. Hydro

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

Division South Interior Location Total All Divisions Type Probable Date 11 July 1983

DESCRIPTION	ACTUAL 1982/83	FISCAL YEARS PROJECTION 1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
1. RESIDENTIAL												
ACCOUNTS AT YEAR END	90 635	93 450	95 930	98 680	101 480	104 370	107 360	110 410	113 490	116 580	119 730	122 970
AVERAGE ACCOUNTS FOR YEAR	90 438	92 330	94 570	97 280	100 070	102 890	105 850	108 870	111 950	115 020	118 140	121 320
ANNUAL USE PER ACCOUNT — KWH	8 734	8 725	8 715	8 700	8 690	8 680	8 660	8 630	8 590	8 550	8 570	8 480
SALES — GWH	790	806	824	846	870	893	917	940	962	984	1 006	1 029
2. HEATING												
ACCOUNTS AT YEAR END	22 468	23 430	24 670	26 090	27 540	29 030	30 550	32 110	33 680	35 270	36 885	38 530
AVERAGE ACCOUNTS FOR YEAR	21 690	22 870	23 980	25 360	26 810	28 270	29 780	31 320	32 890	34 470	36 060	37 690
ANNUAL USE PER ACCOUNT — KWH	16 029	17 010	16 865	16 665	16 475	16 295	16 115	15 935	15 750	15 560	15 380	15 230
SALES — GWH	347	389	405	423	441	461	480	499	518	536	554	574
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	113 103	116 880	120 600	124 770	129 020	133 400	137 910	142 520	147 170	151 850	156 615	161 500
AVERAGE ACCOUNTS FOR YEAR	112 128	115 200	118 550	122 640	126 880	131 160	135 630	140 190	144 840	149 490	154 200	159 010
ANNUAL USE PER ACCOUNT — KWH	10 145	10 370	10 366	10 347	10 335	10 321	10 297	10 262	10 216	10 170	10 117	10 084
SALES — GWH	1 137	1 195	1 229	1 269	1 311	1 354	1 397	1 439	1 480	1 520	1 560	1 603
GENERAL												
1. GENERAL — UNDER 35 KV												
ACCOUNTS AT YEAR END	14 689	14 930	15 230	15 530	15 880	16 270	16 680	17 110	17 550	18 010	18 490	19 010
AVERAGE ACCOUNTS FOR YEAR	14 611	14 810	15 090	15 380	15 705	16 075	16 475	16 895	17 330	17 780	18 250	18 750
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	277	280	287	294	302	310	320	331	343	356	369	383
2. GENERAL — 35 KV AND OVER												
ACCOUNTS AT YEAR END	1 899	2 000	2 110	2 220	2 330	2 450	2 570	2 700	2 830	2 970	3 120	3 270
AVERAGE ACCOUNTS FOR YEAR	1 874	1 950	2 035	2 165	2 275	2 390	2 510	2 635	2 765	2 900	3 045	3 195
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	867	877	920	979	1 010	1 035	1 062	1 088	1 125	1 157	1 197	1 256
TOTAL GENERAL												
ACCOUNTS AT YEAR END	16 588	16 930	17 340	17 750	18 210	18 720	19 250	19 810	20 380	20 980	21 610	22 280
AVERAGE ACCOUNTS FOR YEAR	16 485	16 760	17 125	17 545	17 980	18 465	18 985	19 530	20 095	20 680	21 295	21 945
SALES — GWH	1 144	1 157	1 207	1 273	1 312	1 345	1 382	1 419	1 466	1 513	1 566	1 619
IRRIGATION												
ACCOUNTS AT YEAR END	1 417	1 474	1 528	1 588	1 635	1 685	1 735	1 787	1 841	1 896	1 953	2 012
AVERAGE ACCOUNTS FOR YEAR	1 379	1 446	1 501	1 558	1 612	1 660	1 710	1 761	1 814	1 869	1 925	1 983
SALES — GWH	37	39	41	43	45	46	48	49	51	53	56	59
STREET LIGHTING												
SALES — GWH	26	26	27	27	28	28	29	30	30	31	32	33
TRANSMISSION RATE a												
ACCOUNTS AT YEAR END	12	15	15	15	15	15	15	15	17	17	18	19
AVERAGE ACCOUNTS FOR YEAR	12	15	15	15	15	15	15	15	17	17	18	19
SALES — GWH	1 891	2 060	2 145	2 210	2 345	2 345	2 480	2 535	2 620	2 745	2 970	3 145
WITH-UTILITY b												
ACCOUNTS AT YEAR END	1	1	1	1	1	1	1	1	1	1	1	1
AVERAGE ACCOUNTS FOR YEAR	1	1	1	1	1	1	1	1	1	1	1	1
SALES — GWH	15	120	180	260	420	500	660	800	950	1 230	1 560	1 840
EXPORT TO U.S.A.												
ACCOUNTS AT YEAR END	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE ACCOUNTS FOR YEAR	-	-	-	-	-	-	-	-	-	-	-	-
SALES — GWH	-	-	-	-	-	-	-	-	-	-	-	-
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	204	186	171	169	170	170	172	174	176	178	180	182
AVERAGE ACCOUNTS FOR YEAR	227	195	179	170	170	170	171	173	175	177	179	181
SALES — GWH	23	22	21	19	18	18	18	18	18	18	18	19
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	131 325	135 486	139 655	144 293	149 051	153 991	159 083	164 307	169 585	174 922	180 377	185 994
AVERAGE ACCOUNTS FOR YEAR	130 232	133 617	137 371	141 929	146 658	151 471	156 512	161 670	166 942	172 234	177 618	183 139
SALES — GWH	4 273	4 619	4 850	5 101	5 479	5 636	6 014	6 290	6 615	7 110	7 762	8 318

a Includes Cominco requirements

b Includes West Kootenay Power and Light Co. Ltd. requirements

LOAD FORECAST DEPARTMENT

B.C. Hydro

PROBABLE PROJECTION OF ELECTRIC POWER SALES

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

Division: Vancouver Island Location: Total All Districts Type: Probable Date: 11 July 1983

DESCRIPTION	ACTUAL 1982/83	FISCAL YEARS PROJECTION 1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
1. [redacted]												
ACCOUNTS AT YEAR END	141 543	141 930	142 020	143 660	146 460	149 260	152 250	155 390	158 620	161 930	165 360	168 930
AVERAGE ACCOUNTS FOR YEAR	142 623	142 040	141 820	142 210	145 110	147 800	150 710	153 790	156 990	160 240	163 620	167 100
ANNUAL USE PER ACCOUNT — KWH	8 847	8 835	8 835	8 830	8 715	8 600	8 480	8 345	8 200	8 060	7 890	7 760
SALES — GWH	1 262	1 254	1 253	1 256	1 265	1 271	1 278	1 284	1 288	1 289	1 291	1 297
2. [redacted]												
ACCOUNTS AT YEAR END	64 795	69 270	74 850	79 460	83 040	86 750	90 440	94 100	98 090	101 210	104 700	108 230
AVERAGE ACCOUNTS FOR YEAR	61 731	66 580	71 960	77 730	81 190	84 890	88 600	92 280	95 920	99 460	102 950	106 430
ANNUAL USE PER ACCOUNT — KWH	15 244	15 720	15 510	15 310	15 030	14 765	14 500	14 235	13 970	13 720	13 480	13 250
SALES — GWH	941	1 047	1 116	1 190	1 220	1 253	1 284	1 313	1 339	1 364	1 387	1 410
TOTAL RESIDENTIAL												
ACCOUNTS AT YEAR END	206 338	211 200	216 870	223 120	229 500	236 010	242 690	249 490	256 710	263 140	270 060	277 160
AVERAGE ACCOUNTS FOR YEAR	204 354	208 620	213 780	219 940	226 300	232 690	239 310	246 070	252 910	259 700	266 570	273 550
ANNUAL USE PER ACCOUNT — KWH	10 779	11 029	11 082	11 120	10 981	10 849	10 707	10 556	10 388	10 214	10 046	9 895
SALES — GWH	2 203	2 301	2 369	2 446	2 485	2 524	2 562	2 597	2 627	2 653	2 678	2 707
GENERAL												
1. [redacted]												
ACCOUNTS AT YEAR END	23 650	23 900	24 220	24 560	24 920	25 300	25 710	26 160	26 650	27 160	27 690	28 220
AVERAGE ACCOUNTS FOR YEAR	23 584	23 790	24 080	24 390	24 740	25 110	25 505	25 935	26 405	26 905	27 425	27 955
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	454	460	465	471	477	487	497	508	520	533	546	559
2. [redacted]												
ACCOUNTS AT YEAR END	2 832	3 000	3 150	3 300	3 450	3 610	3 770	3 940	4 110	4 290	4 470	4 660
AVERAGE ACCOUNTS FOR YEAR	2 767	2 920	3 060	3 225	3 375	3 530	3 690	3 855	4 025	4 200	4 380	4 565
ANNUAL USE PER ACCOUNT — KWH												
SALES — GWH	1 009	1 048	1 106	1 167	1 202	1 232	1 262	1 284	1 312	1 336	1 375	1 420
TOTAL GENERAL												
ACCOUNTS AT YEAR END	26 482	26 900	27 370	27 860	28 370	28 910	29 480	30 100	30 760	31 450	32 160	32 880
AVERAGE ACCOUNTS FOR YEAR	26 351	26 710	27 140	27 615	28 115	28 640	29 195	29 790	30 430	31 105	31 805	32 520
SALES — GWH	1 463	1 508	1 571	1 638	1 679	1 719	1 759	1 792	1 832	1 869	1 921	1 979
IRRIGATION												
ACCOUNTS AT YEAR END	279	282	287	292	296	300	305	310	315	320	325	330
AVERAGE ACCOUNTS FOR YEAR	274	281	285	290	294	298	303	308	313	318	323	328
SALES — GWH	4	3	3	3	3	3	4	4	4	4	4	4
STREET LIGHTING												
SALES — GWH	39	40	40	41	41	43	43	44	45	46	47	48
TRANSMISSION RATE												
ACCOUNTS AT YEAR END	9	9	9	9	9	10	11	11	11	11	11	11
AVERAGE ACCOUNTS FOR YEAR	9	9	9	9	9	10	11	11	11	11	11	11
SALES — GWH	2 747	2 985	3 175	3 305	3 315	3 320	3 455	3 500	3 580	3 695	3 815	3 935
INTERRUPTIBLE												
ACCOUNTS AT YEAR END	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE ACCOUNTS FOR YEAR	-	-	-	-	-	-	-	-	-	-	-	-
SALES — GWH	-	-	-	-	-	-	-	-	-	-	-	-
EXPORT TO U.S.A.												
ACCOUNTS AT YEAR END	-	-	-	-	-	-	-	-	-	-	-	-
AVERAGE ACCOUNTS FOR YEAR	-	-	-	-	-	-	-	-	-	-	-	-
SALES — GWH	-	-	-	-	-	-	-	-	-	-	-	-
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	55	53	52	52	52	52	53	53	53	54	54	55
AVERAGE ACCOUNTS FOR YEAR	54	54	53	52	52	52	53	53	53	54	54	55
SALES — GWH	6	7	7	8	8	8	8	8	9	9	9	9
TOTAL FORECAST SALES												
ACCOUNTS AT YEAR END	233 163	238 444	244 588	251 333	258 227	265 282	272 539	279 964	287 849	294 975	302 610	310 436
AVERAGE ACCOUNTS FOR YEAR	231 042	235 674	241 267	247 906	254 770	261 690	268 872	276 232	283 717	291 188	298 763	306 466
SALES — GWH	6 462	6 844	7 165	7 441	7 531	7 617	7 831	7 945	8 097	8 276	8 474	8 682

LOAD FORECAST DEPARTMENT

B.C. HYDRO
AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES
HISTORIC & PROBABLE PROJECTIONS
TOTAL HYDRO[a]

TABLE 7-7

	RESIDENTIAL			GENERAL - UNDER 35 KW			GENERAL - 35 KW & OVER			TRANSMISSION RATE[b]			OTHER[c]			M.K.P.& L. + S.C.L.			TOTAL SALES	
	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES[d] (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																				
1972/73	649,614	4,739	26.5	91,648	1,846	8.6	6,116	4,113	23.0	45	7,864	39.4	1,949	483	2.8				748,771	17,917
1973/74	663,767	5,176	26.1	95,614	1,706	8.6	6,825	4,672	23.6	46	7,776	39.3	2,048	470	2.4				767,497	19,800
1974/75	717,488	5,668	27.6	99,388	1,844	9.0	6,482	4,841	23.5	46	7,714	37.5	2,232	495	2.4				825,615	20,579
1975/76	746,815	6,258	30.3	103,938	1,988	9.6	6,998	5,077	24.6	47	6,888	32.9	2,424	532	2.6				860,214	20,660
1976/77	782,678	6,625	28.9	108,898	2,021	8.8	7,888	5,571	24.3	47	8,164	35.6	2,585	541	2.4				901,686	22,924
1977/78	815,263	7,881	29.2	110,243	2,181	8.7	8,684	5,972	24.7	48	8,479	35.1	2,668	561	2.3				936,876	24,164
1978/79	847,394	7,492	29.1	112,384	2,159	8.4	9,442	6,353	24.7	52	9,133	35.5	2,789	583	2.3				972,061	25,720
1979/80	871,021	7,727	29.1	113,798	2,213	8.3	10,436	6,734	25.4	58	9,217	34.8	2,841	625	2.4				996,148	26,516
1980/81	900,811	8,042	29.2	115,889	2,226	8.1	11,822	7,118	25.8	59	9,597	34.8	2,994	581	2.1				1,029,975	27,564
1981/82	929,778	8,440	30.5	116,397	2,320	8.2	12,894	7,378	26.1	62	9,339	33.0	3,121	609	2.2	1	14	0.0	1,062,848	28,388
1982/83	957,185	8,821	31.3	117,617	2,361	8.2	14,071	7,483	26.2	65	9,046	32.1	3,099	620	2.2	1	15	0.0	1,092,838	28,286
AVG. ANNUAL GROWTH (%) 10 YEARS 72/3-82/3	4.0	6.4		2.5	4.1		8.7	6.1		3.7	8.5		4.7	5.2					3.8	4.6
PROJECTIONS																				
1983/84	979,290	9,196	30.9	118,880	2,324	7.8	14,730	7,642	25.7	70	9,685	33.0	3,169	633	2.1	1	189	0.6	1,113,810	29,748
1984/85	1,005,310	9,441	30.1	119,980	2,386	7.8	15,345	8,021	25.5	72	10,610	34.3	3,248	648	2.0	1	180	0.6	1,143,876	31,475
1985/86	1,034,190	9,748	29.4	121,240	2,398	7.2	16,178	8,447	25.4	74	11,548	34.8	3,325	661	2.0	2	396	1.2	1,178,301	33,192
1986/87	1,063,960	10,082	29.1	123,478	2,448	7.1	16,930	8,716	25.3	75	11,630	34.4	3,411	680	2.0	2	758	2.1	1,207,848	34,486
1987/88	1,093,840	10,298	29.2	125,498	2,492	7.1	17,715	8,899	25.4	77	11,985	33.9	3,493	700	2.0	2	818	2.3	1,240,617	35,069
1988/89	1,124,730	10,506	28.9	127,610	2,547	7.0	18,535	9,097	25.0	80	12,475	34.3	3,588	722	2.0	2	978	2.7	1,276,289	36,325
1989/90	1,156,210	10,746	28.8	129,840	2,607	7.0	19,375	9,298	24.9	80	12,835	34.4	3,671	743	2.0	2	1,118	3.0	1,309,178	37,344
1990/91	1,188,940	10,972	28.6	132,160	2,663	6.9	20,225	9,511	24.7	83	13,250	34.5	3,763	764	2.0	2	1,268	3.3	1,344,275	38,438
1991/92	1,219,600	11,183	28.1	134,585	2,728	6.9	21,090	9,738	24.5	85	13,760	34.6	3,861	788	2.0	2	1,548	3.9	1,379,193	39,765
1992/93	1,251,490	11,387	27.6	137,020	2,795	6.8	21,980	9,972	24.2	87	14,415	34.9	3,956	812	2.0	2	1,878	4.6	1,414,838	41,259
1993/94	1,283,760	11,686	27.2	139,860	2,863	6.7	22,890	10,288	24.1	89	14,995	35.1	4,056	836	2.0	2	2,158	5.0	1,456,357	42,796
2002/03	1,644,880	14,649		168,830	3,588		32,630	13,822			20,845			1,075		2	3,328			56,707
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-92/93	2.7	2.5		1.6	2.0		4.5	3.0		2.9	4.7		2.5	2.8		6.5	57.1		2.6	3.9
10 YEARS 93/94-02/03	2.5	2.4		1.7	2.3		3.4	2.8			3.8			2.5			4.4			2.9

NOTES:

a DC Power to Transit and Hydro Use for transit buildings are included in "Other" to 1979/80. As of 1 April 1980 these sales are included in "General - 35 kW and Over" and "General - Under 35 kW".

b Includes sales requirements of Cominco Ltd. starting 1993/94.

c Other - AV Cust. - does not include Street Lighting accounts.

d Other - Sales - includes Irrigation, Street Lighting, Inter-Utility, Export and B.C. Hydro use.

B.C. HYDRO

AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES

HISTORIC & PROBABLE PROJECTIONS

LOWER MAINLAND[a]

TABLE 7-8

	RESIDENTIAL			GENERAL - UNDER 35 KW			GENERAL - 35 KW & OVER			TRANSMISSION RATE			OTHER[b]			OTHER[c]			W.K.P.& L. & B.C.L.			TOTAL SALES	
	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																							
1972/73	384,188	2,476	30.6	52,098	864	10.9	3,225	2,521	31.1	16	1,882	23.2	564	343	4.2							440,088	8,106
1973/74	399,736	2,662	29.9	53,765	985	10.7	3,368	2,833	31.8	16	2,092	23.5	578	361	4.1							457,463	8,903
1974/75	416,578	2,868	30.7	55,882	1,027	11.0	3,611	2,944	31.5	16	2,132	22.9	641	348	3.9							476,398	9,336
1975/76	428,698	3,116	33.0	57,873	1,091	11.5	3,907	3,028	32.1	17	1,821	19.3	710	384	4.1							490,681	9,442
1976/77	444,196	3,269	31.6	60,137	1,096	10.7	4,362	3,297	32.0	17	2,228	21.6	737	403	3.9							509,449	10,293
1977/78	461,183	3,444	31.8	61,184	1,127	10.4	4,781	3,496	32.3	17	2,344	21.7	748	418	3.8							527,823	10,821
1978/79	478,401	3,657	31.8	61,970	1,153	10.0	5,118	3,705	32.2	20	2,568	22.3	779	431	3.7							546,288	11,514
1979/80	490,345	3,828	31.8	62,516	1,167	9.8	5,599	3,908	32.5	20	2,657	22.1	800	456	3.8							559,288	12,016
1980/81	505,243	3,994	32.1	63,142	1,199	9.7	6,263	4,131	33.2	21	2,699	21.7	781	414	3.3							575,450	12,437
1981/82	517,792	4,048	32.7	63,484	1,259	9.7	6,776	4,364	33.6	22	2,677	20.6	809	435	3.4							588,881	12,983
1982/83	532,747	4,329	34.3	64,275	1,254	9.9	7,373	4,290	33.9	24	2,322	18.4	831	440	3.5							605,248	12,635
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/3	3.3	5.7		2.1	3.6		8.6	5.8		4.1	2.1		4.0	2.5								3.2	4.5
PROJECTIONS																							
1983/84	544,980	4,882	34.1	64,640	1,258	9.5	7,718	4,384	33.3	24	2,598	19.6	856	449	3.4							618,128	13,188
1984/85	559,190	4,636	33.3	65,190	1,270	9.1	8,085	4,597	33.0	25	2,980	21.2	878	467	3.3							633,248	13,989
1985/86	575,150	4,769	32.8	65,965	1,288	8.8	8,410	4,827	32.9	25	3,168	21.6	898	469	3.2	1	136	0.9	649,461	14,654			
1986/87	589,530	4,908	32.3	66,885	1,310	8.6	8,798	4,981	32.8	25	3,188	21.0	904	488	3.2	1	316	2.1	666,138	15,184			
1987/88	604,910	5,039	32.6	67,840	1,334	8.6	9,180	5,067	32.8	25	3,200	20.7	922	501	3.2	1	316	2.1	682,698	15,459			
1988/89	620,740	5,173	32.6	68,850	1,360	8.6	9,585	5,166	32.6	25	3,315	20.9	940	516	3.3	1	316	2.0	700,141	15,846			
1989/90	634,810	5,299	32.8	69,860	1,387	8.6	9,995	5,267	32.6	25	3,365	20.8	958	532	3.3	1	316	2.0	717,649	16,166			
1990/91	653,090	5,419	32.9	70,885	1,408	8.5	10,405	5,370	32.6	25	3,430	20.8	978	550	3.3	1	316	1.9	735,896	16,495			
1991/92	668,980	5,531	32.8	71,925	1,436	8.5	10,815	5,494	32.6	27	3,500	20.8	998	567	3.4	1	316	1.9	752,746	16,844			
1992/93	688,070	5,638	32.8	72,990	1,468	8.5	11,230	5,593	32.5	27	3,610	21.0	1,018	583	3.4	1	316	1.8	770,336	17,204			
1993/94	701,280	5,747	32.6	74,080	1,494	8.5	11,650	5,767	32.7	27	3,685	20.9	1,038	601	3.4	1	316	1.8	788,076	17,612			
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	2.8	2.6		1.3	1.6		4.2	2.7		1.1	4.3		2.0	2.9								2.4	3.1

NOTES:

a DC Power to Transit and Hydro Use for transit buildings are included in "Other" to 1979/80. As of 1 April 1980 these sales are included in "General - 35 kW and Over" and "General - Under kW".

b Other - AV Cust. - does not include Street Lighting accounts.

c Other - Sales - includes Irrigation, Street Lighting, Inter-Utility, Export and B.C. Hydro use.

B.C. HYDRO
AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES
HISTORIC & PROBABLE PROJECTIONS
CENTRAL INTERIOR

TABLE 7-9

	RESIDENTIAL			GENERAL - UNDER 35 KW			GENERAL - 35 KW & OVER			TRANSMISSION RATE			OTHER [a]			M.K.P.& L. + S.C.L.			TOTAL SALES [b]	
	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																				
1972/73	47,289	411	18.8	7,586	139	6.3	799	491	22.2	18	1,146	51.7	188	28	1.3					
1973/74	51,621	448	18.8	8,078	161	6.4	724	552	21.8	18	1,333	52.7	196	14	0.6				88,789	2,218
1974/75	55,721	525	20.2	8,456	174	6.7	776	591	22.7	18	1,283	49.4	207	25	1.0				60,836	2,586
1975/76	58,778	572	21.3	8,772	183	6.8	826	670	25.3	18	1,221	46.8	200	29	1.1				68,179	2,698
1976/77	62,718	663	20.8	9,158	189	6.4	834	736	25.0	18	1,368	47.1	225	29	1.0				68,836	2,683
1977/78	68,681	663	20.6	9,275	203	6.3	981	809	25.1	18	1,515	47.0	230	31	1.0				72,959	2,948
1978/79	68,769	708	21.5	9,761	215	6.6	1,882	861	26.2	11	1,471	44.7	233	33	1.0				76,837	3,221
1979/80	71,622	723	21.2	10,128	219	6.4	1,137	926	27.2	12	1,504	44.2	251	34	1.0				79,756	3,388
1980/81	75,293	764	21.0	10,409	228	6.4	1,209	978	27.6	12	1,560	44.0	277	33	0.9				83,147	3,486
1981/82	78,766	793	22.4	10,644	238	6.6	1,383	984	27.8	14	1,516	42.9	287	38	1.0				87,280	3,843
1982/83	80,830	816	22.3	10,787	225	6.2	1,814	990	27.1	18	1,891	43.8	299	34	0.9				91,134	3,838
AVG. ANNUAL GROWTH (%) 10 YEARS 72/3-82/3	5.5	7.1		3.6	4.9		6.6	7.3		4.1	3.5		4.9	2.0					93,068	3,486
PROJECTIONS																				
1983/84	82,898	880	22.2	10,838	233	6.1	1,898	1,046	27.3	17	1,670	43.6	304	36	0.9					
1984/85	85,158	874	20.9	11,020	239	5.7	1,668	1,099	26.3	17	1,918	46.2	319	38	0.9				98,331	3,835
1985/86	87,870	899	20.8	11,285	248	5.8	1,788	1,160	26.8	18	2,148	47.8	332	39	0.9				98,166	4,188
1986/87	90,698	926	19.8	11,620	252	5.4	1,848	1,199	25.7	19	2,228	48.3	346	40	0.9				101,188	4,688
1987/88	93,848	982	19.9	11,648	260	5.4	1,948	1,232	25.7	20	2,310	48.2	356	41	0.9				104,319	4,672
1988/89	96,518	976	19.5	11,688	267	5.3	2,048	1,268	25.2	21	2,448	48.1	369	43	0.9				107,496	4,795
1989/90	99,548	1,004	18.9	12,148	276	5.2	2,148	1,299	24.5	21	2,575	48.5	381	44	0.8				110,689	5,018
1990/91	102,638	1,029	18.5	12,415	284	5.1	2,248	1,337	24.1	22	2,660	47.8	393	45	0.8				114,227	5,298
1991/92	105,718	1,052	18.1	12,690	293	5.0	2,348	1,371	23.5	22	3,060	52.6	406	46	0.8				117,790	5,888
1992/93	108,888	1,077	17.7	12,970	302	5.0	2,448	1,418	23.1	23	3,258	53.4	418	48	0.8				121,148	5,822
1993/94	112,048	1,102	17.3	13,258	311	4.9	2,548	1,483	22.8	24	3,488	54.2	431	48	0.8				124,701	6,098
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	3.0	2.8		2.0	3.0		6.5	3.6		4.4	7.3		3.4	3.2					138,298	6,369
																			5.0	5.2

NOTES:

a Other - AV Cust. - does not include Street Lighting accounts.

b Other - Sales - includes Irrigation, Street Lighting, Inter-Utility and B.C. Hydro use.

B.C. HYDRO
AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES
HISTORIC & PROBABLE PROJECTIONS
NORTH COAST

TABLE 7-10

	RESIDENTIAL			GENERAL - UNDER 35 KV			GENERAL - 35 KV & OVER			TRANSMISSION RATE			OTHER			H.K.P.& L. + S.C.L.			TOTAL SALES	
	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS[a]	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																				
1972/73	18,711	268	29.0	3,246	60	6.3	304	128	16.7	2	323	45.8	28	7	1.0				22,291	718
1973/74	19,444	228	27.0	3,435	67	7.9	256	152	18.0	2	392	46.3	30	7	0.8				23,167	846
1974/75	20,386	263	28.4	3,863	72	8.4	259	151	17.7	2	381	44.6	34	8	0.9				24,214	855
1975/76	21,273	267	32.9	3,739	66	9.8	283	155	19.1	2	301	37.1	38	9	1.1				25,335	812
1976/77	22,197	273	29.7	3,909	79	8.6	321	183	19.9	2	374	40.8	41	9	1.0				26,670	918
1977/78	22,813	289	30.8	3,998	84	8.9	333	202	21.3	2	364	38.4	44	9	0.9				27,190	948
1978/79	23,320	295	26.5	4,141	88	7.9	348	222	19.9	2	499	44.8	44	10	0.9				27,852	1,114
1979/80	24,826	295	28.4	4,211	91	8.8	381	245	23.8	2	391	38.0	39	10	1.0				28,689	1,038
1980/81	25,264	303	26.5	4,295	91	8.8	435	262	22.9	4	476	41.6	37	11	1.0				30,038	1,143
1981/82	26,680	328	27.1	4,413	94	7.8	486	247	20.4	5	531	43.8	35	11	0.9				31,839	1,211
1982/83	27,426	336	28.5	4,442	91	7.7	543	247	20.9	5	495	42.0	35	11	0.9				32,451	1,180
AVG. ANNUAL GROWTH (%) 10 YEARS 72/73-82/3	3.9	4.9		3.2	4.2		6.0	7.5		9.6	4.4		2.3	4.6					3.8	5.1
PROJECTIONS																				
1983/84	27,980	348	27.7	4,488	93	7.4	540	285	22.7	5	520	41.4	33	11	0.9				33,088	1,257
1984/85	28,640	384	26.8	4,548	95	7.8	585	299	21.9	6	685	44.3	33	11	0.8				33,824	1,364
1985/86	29,598	368	24.2	4,648	97	6.4	618	314	20.6	7	720	47.8	33	12	0.8				34,888	1,508
1986/87	30,860	375	24.4	4,728	99	6.4	648	326	21.1	7	730	47.4	34	12	0.8				35,966	1,540
1987/88	31,840	386	24.7	4,885	101	6.5	675	333	21.3	7	736	46.8	35	12	0.8				37,042	1,562
1988/89	32,860	396	24.5	4,980	103	6.4	710	342	21.2	8	760	47.1	36	13	0.8				38,214	1,614
1989/90	33,680	407	24.8	5,085	105	6.4	750	357	21.7	8	760	46.3	37	14	0.9				39,480	1,643
1990/91	34,640	417	25.0	5,125	108	6.5	790	369	22.1	8	760	45.6	37	14	0.8				40,628	1,668
1991/92	35,720	427	25.2	5,255	110	6.5	835	380	22.5	8	760	44.9	39	14	0.8				41,857	1,691
1992/93	36,800	437	25.3	5,385	113	6.5	885	397	23.0	8	765	44.3	39	15	0.9				43,117	1,727
1993/94	37,880	447	25.3	5,520	116	6.6	935	412	23.4	8	775	43.9	40	15	0.8				44,383	1,765
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	3.0	2.6		2.0	2.2		5.1	4.8		4.4	4.2		1.2	2.9					2.9	3.7

NOTES:

[a] Other - AV Cust. - does not include Street Lighting accounts.

[b] Other - Sales - includes Irrigation, Street Lighting, Export and B.C. Hydro use.

B.C. HYDRO
AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES
HISTORIC & PROBABLE PROJECTIONS
SOUTH INTERIOR

TABLE 7-11

	RESIDENTIAL			GENERAL - UNDER 35 KW			GENERAL - 35 KW & OVER			TRANSMISSION RATE[a]			OTHER			W.K.P.& L. + B.C.L.			TOTAL SALES	
	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS[b]	SALES (GW.H)[c]	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	% OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																				
1972/73	64,684	843	23.2	10,824	147	7.1	767	498	21.2	9	1,894	46.8	969	39	1.7				79,178	2,336
1973/74	72,768	606	23.8	11,469	190	7.2	796	504	22.2	9	1,205	48.7	1,032	58	1.9				86,084	2,438
1974/75	78,674	788	25.4	12,039	209	7.6	766	583	21.2	9	1,205	43.7	1,141	58	2.1				92,829	2,785
1975/76	83,833	788	27.7	12,664	229	8.0	836	611	21.5	9	1,181	40.8	1,219	65	2.3				98,563	2,844
1976/77	88,943	846	27.7	13,381	239	7.8	957	653	21.4	9	1,266	41.2	1,272	58	1.9				104,532	3,056
1977/78	92,136	919	28.2	13,639	254	7.8	1,100	680	20.9	10	1,339	41.1	1,341	66	2.0				109,226	3,258
1978/79	97,148	994	28.1	13,938	267	7.6	1,218	730	20.6	10	1,482	41.9	1,414	64	1.8				113,725	3,537
1979/80	100,125	981	26.9	14,036	269	7.4	1,365	768	21.1	11	1,547	42.5	1,424	77	2.1				116,963	3,642
1980/81	103,376	1,000	26.5	14,172	259	6.8	1,481	801	21.0	12	1,661	43.6	1,575	78	2.1				120,736	3,807
1981/82	108,107	1,082	26.0	14,456	269	6.5	1,777	810	19.5	12	1,907	45.8	1,648	80	1.9	1	14	0.3	125,998	4,162
1982/83	112,128	1,137	26.6	14,611	277	6.5	1,874	867	20.3	12	1,891	44.3	1,686	86	2.0	1	15	0.3	130,232	4,273
AVG. ANNUAL GROWTH (%) 10 YEARS 72/3-82/3	5.3	7.7		3.0	5.8		9.3	5.8		2.9	5.6		5.8	6.8					5.1	6.2
PROJECTIONS																				
1983/84	115,200	1,195	25.9	14,618	280	6.1	1,958	877	19.0	15	2,060	44.6	1,641	87	1.9	1	120	2.6	133,617	4,619
1984/85	118,880	1,229	25.3	15,098	287	5.9	2,038	928	19.0	15	2,145	44.2	1,688	89	1.8	1	160	3.3	137,371	4,850
1985/86	122,640	1,269	24.9	15,588	296	5.8	2,165	979	19.2	15	2,210	43.3	1,728	91	1.7	1	210	4.1	141,989	5,101
1986/87	126,880	1,311	23.9	15,785	302	5.5	2,275	1,010	18.4	15	2,345	42.8	1,762	91	1.7	1	420	7.7	146,658	5,479
1987/88	131,160	1,354	24.0	16,075	310	5.5	2,390	1,038	18.4	15	2,345	41.6	1,830	92	1.6	1	500	8.9	151,471	5,636
1988/89	135,630	1,397	23.2	16,475	320	5.3	2,510	1,062	17.7	15	2,480	41.2	1,881	95	1.6	1	660	11.0	156,512	6,014
1989/90	140,190	1,439	22.9	16,895	331	5.3	2,638	1,088	17.3	15	2,535	40.3	1,934	97	1.5	1	880	12.7	161,670	6,298
1990/91	144,840	1,480	22.4	17,330	343	5.2	2,765	1,123	17.0	17	2,745	39.6	1,989	99	1.5	1	980	14.4	166,942	6,615
1991/92	149,490	1,828	21.4	17,780	356	5.0	2,900	1,157	16.3	17	2,745	38.6	2,046	102	1.4	1	1,230	17.3	172,234	7,118
1992/93	154,200	1,560	20.1	18,250	369	4.7	3,045	1,197	15.4	18	2,970	38.3	2,104	106	1.4	1	1,560	20.1	177,618	7,762
1993/94	159,018	1,661	19.3	18,750	383	4.6	3,195	1,236	14.9	19	3,145	37.8	2,164	111	1.3	1	1,840	22.1	183,139	8,318
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	3.2	3.2		2.3	3.0		5.0	3.3		4.3	4.7		2.7	2.3			34.8		3.1	6.2

NOTES:

a Includes sales requirements of Cominco Ltd. starting 1993/94 - 30 GW.h.

b Other - AV Cust. - does not include Street Lighting accounts.

c Other - Sales - includes Irrigation, Street Lighting, Inter-Utility and B.C. Hydro Use.

B.C. HYDRO
AVERAGE ACCOUNTS AND ELECTRIC ENERGY SALES
HISTORIC & PROBABLE PROJECTIONS
VANCOUVER ISLAND [a]

TABLE 7-12

	RESIDENTIAL			GENERAL - UNDER 35 KM			GENERAL - 35 KM & OVER			TRANSMISSION RATE			OTHER			H.K.P.& L. + S.C.L.			TOTAL SALES	
	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS [b]	SALES (GW.H) [c]	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)	X OF TOTAL	AVG NO ACCOUNTS	SALES (GW.H)
HISTORIC																				
1972/73	132,258	1,101	24.3	17,971	296	6.5	1,021	486	10.7	8	2,621	57.7	283	36	0.8				151,458	4,540
1973/74	139,998	1,212	24.8	18,850	333	6.8	971	551	11.3	9	2,754	56.3	289	38	0.8				160,037	4,888
1974/75	147,956	1,349	26.8	19,770	362	7.2	1,040	572	11.3	9	2,713	53.9	229	39	0.8				169,004	5,035
1975/76	154,836	1,515	31.1	20,890	402	8.2	1,136	605	12.4	9	2,314	47.4	257	43	0.9				177,128	4,879
1976/77	164,427	1,634	28.6	22,046	418	7.3	1,334	702	12.3	9	2,914	51.1	280	42	0.7				188,096	5,712
1977/78	172,538	1,736	29.3	22,177	433	7.3	1,549	785	13.3	9	2,917	49.3	305	45	0.8				196,598	5,916
1978/79	179,756	1,838	29.3	22,597	436	7.0	1,789	835	13.3	9	3,113	49.7	319	45	0.7				204,448	6,267
1979/80	184,903	1,905	29.7	22,902	447	7.0	1,954	869	13.9	10	3,118	48.7	327	46	0.7				210,896	6,408
1980/81	190,635	1,993	30.0	23,071	449	6.8	2,234	946	14.3	10	3,201	48.2	326	45	0.7				216,474	6,634
1981/82	198,505	2,189	34.1	23,416	471	7.3	2,474	1,003	15.6	9	2,706	42.2	322	48	0.8				224,726	6,417
1982/83	204,354	2,203	34.1	23,584	454	7.0	2,767	1,009	15.6	9	2,747	42.5	328	49	0.8				231,042	6,462
AVG. ANNUAL GROWTH (%) 10 YEARS 72/3-82/3	4.4	7.2		2.8	4.4		10.5	7.6		1.2	0.5		4.9	3.1					4.3	3.6
PROJECTIONS																				
1983/84	208,620	2,301	33.6	23,790	468	6.7	2,928	1,048	15.3	9	2,985	43.6	335	50	0.7				235,674	6,844
1984/85	213,780	2,369	33.1	24,080	465	6.5	3,060	1,106	15.4	9	3,175	44.3	338	50	0.7				241,267	7,168
1985/86	219,940	2,446	32.9	24,390	471	6.3	3,225	1,167	15.7	9	3,305	44.4	342	52	0.7				247,906	7,441
1986/87	226,300	2,485	33.0	24,740	477	6.3	3,375	1,202	16.0	9	3,315	44.0	346	52	0.7				254,770	7,531
1987/88	232,690	2,524	33.1	25,110	487	6.4	3,530	1,232	16.2	10	3,320	43.6	350	54	0.7				261,690	7,617
1988/89	239,310	2,562	32.7	25,505	497	6.4	3,690	1,262	16.1	11	3,455	44.1	356	55	0.7				268,872	7,831
1989/90	246,070	2,597	32.7	25,935	508	6.4	3,855	1,284	16.2	11	3,500	44.1	361	56	0.7				276,232	7,948
1990/91	252,910	2,627	32.4	26,405	520	6.4	4,025	1,312	16.2	11	3,580	44.2	366	58	0.7				283,717	8,097
1991/92	259,700	2,653	32.1	26,905	533	6.4	4,208	1,336	16.1	11	3,695	44.7	372	59	0.7				291,188	8,276
1992/93	266,570	2,678	31.6	27,425	546	6.4	4,380	1,375	16.2	11	3,815	45.0	377	60	0.7				298,763	8,474
1993/94	273,550	2,707	31.2	27,955	559	6.4	4,565	1,420	16.4	11	3,935	45.3	383	61	0.7				306,464	8,682
AVG. ANNUAL GROWTH (%) 11 YEARS 82/83-93/94	2.7	1.9		1.6	1.9		4.7	3.2		1.8	3.3		1.4	2.0					2.6	2.7

NOTES:

a Assumes Natural Gas on Vancouver Island by 1986/87.

b Other - AV Cust. - does not include Street Lighting accounts.

c Other - Sales - includes Irrigation, Street Lighting and B.C. Hydro Use.

PART EIGHT

ELECTRIC-PROBABLE GROSS REQUIREMENTS FOR SYSTEM PLANNING

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PART EIGHT

ELECTRIC-PROBABLE GROSS REQUIREMENTS FOR SYSTEM PLANNING

8.1 Present Electric System

B. C. Hydro is presently providing electricity to 1 126 000 customers in British Columbia. These customers encompass approximately 93% of the population of the Province with the remaining 7% served by the West Kootenay Power and Light Co. Ltd and the City of Nelson.

Ninety-nine and a half percent (99.5%) of the total B. C. Hydro load is in the integrated system. The remainder of the load is in several non-integrated areas largely served by diesel generating stations.

The B. C. Hydro system is separated into five (5) operating divisions; Lower Mainland, Central Interior, North Coast, South Interior and Vancouver Island. See Figure 8-1. The divisions in turn are separated into a number of districts. Further, some of the major districts are broken down into sub-districts.

Sixty-five (65) of B. C. Hydro's customers are large, mainly industrial loads served at transmission voltage and accounting for about one third of total sales.

8.2 Electric System Planning

For system planning of generation, transmission and distribution facilities, the forecast of electric energy sales is used to calculate gross electric energy requirements and peak demand for B. C. Hydro's integrated and non-integrated systems.

For the total integrated system, gross electric energy requirements, stated in GW.h, and peak demand, stated in MW, are derived as follows:

- distribution losses of 6.9% and transmission losses of 8.3% are added to distribution (residential plus general plus other) sales. An annual load factor of 59.4% is applied to the gross electric energy requirements to estimate the coincident distribution peak demand. The loss, percentages and load factor are estimated from historical records and trends;

- transmission losses of 8.3% are added to transmission rate sales. An annual load factor, based on historical trends, of 80% is applied to the gross electric energy requirements to estimate the coincident transmission rate peak demand.

- transmission losses of 8.3% are added to WKP&L plus Seattle City Light sales requirements to determine their gross electric energy requirements. Their coincident peak demand is estimated by adding their projected peak demand requirements (see Part Six) and diversifying to 90%.

Figure 8-1
B.C. HYDRO
DIVISIONAL MAP

The total integrated gross electric energy requirements are the sum of the three above calculations. The total integrated system coincident peak demand is the sum of the above three estimated peak demand components.

For the non-integrated areas the following steps are used to determine projections for the individual stations.

- distribution losses are added to area-specific sales to obtain gross electric energy requirements;

- an annual load factor, based on historical experience, is applied to the gross electric energy requirements to obtain peak demand estimates.

The projected annual peak loads for the integrated system and non-integrated areas are based on normal winter temperatures. For the integrated system, this is based on an approximate mean temperature of -7 degrees C. at the Vancouver International Airport occurring on a Monday, Tuesday or Wednesday in the two weeks immediately before Christmas or early in the New Year. Cold weather allowance factors are specified (TABLE 8-2) for the two main components (Mainland and Vancouver Island) of the integrated system and each non-integrated area to indicate a range by which the normal temperature peaks may be exceeded in perhaps one year in ten. These are to be used as guides by Engineering and Operations as they consider necessary.

TABLE 8-1 shows, using a category buildup, historical and forecast electric energy requirements over a 32-year period (11 years history and 21 years projected) for total B. C. Hydro.

Details to 1988/89 of Probable Projections of Gross Electric Power Requirements for both the integrated and non-integrated areas are shown on TABLE 8-2.

Extended projections for the integrated system are shown on TABLE 8-3.

8.3 Vancouver Island

Because of its geographic location, i.e. isolated from the Mainland area, studies encompassing the load on the Vancouver Island integrated system only are often required. The forecast assumes natural gas will be available on Vancouver Island by 1986/87 but because of the still remaining uncertainty as to timing, a projection assuming no natural gas on Vancouver Island is also provided for general information.

TABLE 8-4 shows projected peak and energy requirements for the Vancouver Island integrated system with and without natural gas:

- columns 1 and 2 give the approved 1983 projection i.e. natural gas on Vancouver Island by 1986/87;

- columns 3 and 4 give the projection assuming natural gas is <u>not</u> extended to Vancouver Island. This projection is <u>not</u> a maximum

electric forecast i.e. no policy change is assumed to promote electricity (conversion from oil to electricity) on Vancouver Island;

- columns 5 and 6 give the additional electric requirements if gas is not extended to Vancouver Island. Similar to columns 3 and 4 this is not a maximum case but the difference in assumptions between columns 1, 2 and 3, 4.

8.4 Distribution System Planning

For distribution planning purposes, sales for each district are taken separately, losses added and using an annual load factor a 6-year forecast of peak demand for each district is made. The peak estimates are based on normal weather and a percentage allowance is specified by which these normal winter peak demands may be exceeded should colder weather occur in say one year out of ten.

Concurrent with the foregoing forecast preparation, B. C. Hydro's Distribution Engineering Department prepare independent forecasts of substation peak demands for each power district and sub-district. Load Forecast and Distribution Engineering together meet with divisional staffs to review the peak load projections and, considering load diversity, arrive at a consensus for distribution planning purposes.

The Lower Mainland Division consists of five very large and closely woven areas. Because system and distribution planning generally involve handling the Division as one homogenous area, no area peak forecasts are presently made by Load Forecast.

8.5 Comparison of Actual Energy Requirements with Forecasts

Refer to TABLE's 8-5 and 8-6. TABLE 8-5 shows the deviation in percent that resulted when comparing the actual load that materialized to the probable load projected a number of years before. For example, the probable projection made in 1972 for five years out, i.e. 1976/77, turned out to be 11.1% high. Some clarifying points re the table:

- a negative sign indicates the forecast turned out to be low;
- from 1966 through 1968, only a 5-year plus base year forecast was made;
- from 1970 through 1975 only a single load projection was made. It was a probable forecast for the first five years but trended to a high forecast through the second five years. This has the effect of distorting the deviation the further out the comparison to actual is made.

TABLE 8-6 shows a comparison of actual energy requirements in GW.h with the probable forecast.

B. C. HYDRO

TABLE B-1

HISTORIC AND PROBABLE PROJECTIONS OF ELECTRIC POWER REQUIREMENTS BY SALES CATEGORIES

FISCAL YEAR	Residential		Total General		Other		UKPML Co. Ltd. Load Requirements		Seattle City Light Load Requirements		Total Sales Less Trans. Rate		Trans. Rate Sales		Total Billed Sales		Losses & Accruals		Total Gross Requirements (Including UKP&L Co. Ltd. & Canfac Requirements) Energy		Peak	
	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	Annual % Growth	GW.h	% of Total Sales	GW.h	Annual % Growth	MW[a]	Annual % Growth
1972/73	4 739	6.1	5 689	7.5	453	-26.5					10 851	5.1	7 066	20.6	17 917	10.7	2 432	13.6	20 349	13.5	3 853	16.7
73/74	5 175	9.2	6 378	12.7	470	3.8					12 024	10.8	7 776	10.0	19 800	10.5	2 686	13.4	22 486	10.4	3 739	2.4
74/75	5 688	9.8	6 685	4.8	495	5.3					12 868	7.0	7 714	-0.8	20 579	3.9	2 815	13.7	23 394	4.2	3 957	5.8
75/76	6 258	10.1	7 882	5.6	532	7.5					13 852	7.7	6 808[b]	-11.7	20 660	0.4	2 878	13.9	23 538	0.6	4 232	6.9
76/77	6 625	5.9	7 582	7.5	541	1.7					14 758	6.5	8 166	19.9	22 924	11.0	3 072	13.4	25 996	10.4	4 421	4.5
1977/78	7 051	6.4	8 073	6.3	561	3.7					15 686	6.3	8 479	3.8	24 164	5.4	3 372	14.0	27 536	5.9	4 800	8.6
78/79	7 482	6.3	8 512	5.4	583	3.9					16 567	5.8	9 133	7.7	25 700	6.4	3 628	14.1	29 348	6.6	5 122	6.7
79/80	7 727	3.1	8 949	5.1	625	7.2					17 301	4.3	9 217	0.9	26 518	3.1	3 455	13.0	29 973	2.1	5 231	2.1
80/81	8 042	4.1	9 344	4.4	581	-7.0					17 967	3.8	9 587	4.1	27 564	3.9	3 594	13.0	31 158	4.0	5 511	5.4
81/82	8 640	7.4	9 786	3.9	609	4.8	14	-			18 969	5.6	9 330[c]	-2.7	28 300	2.7	4 051	14.3	32 389	3.9	5 939	7.8
1982/83	8 821	2.1	9 704	-	620	1.8	15	7.1			19 160	1.0	9 046	-3.1	28 206	-0.4	3 307	11.7	31 513	-2.6	5 537	-6.8
Av. Annual Growth % 10 Yrs. 72/73-82/83	6.4		5.5		3.2		-				5.9		2.5		4.6		-		4.5		4.2	
PROJECTIONS																						
1983/84	9 196	4.3	9 966	2.7	633	2.1	120	-			19 915	3.9	9 825	8.6	29 740	5.4	3 980	13.3	33 690	6.9	6 050	9.3
84/85	9 461	2.9	10 377	4.1	645	1.9	180	50.0			20 663	3.8	10 810	10.0	31 473	5.8	4 147	13.2	35 620	5.7	6 400	5.8
85/86	9 748	3.0	10 842	4.5	661	2.5	260	44.4	136	-	21 647	4.8	11 546	6.8	33 192	5.5	4 348	13.1	37 540	5.4	6 850	7.0
86/87	10 082	3.4	11 156	2.9	680	2.9	420	61.5	318	-	22 576	4.3	11 930	3.3	34 506	3.7	4 494	13.0	38 880	3.6	7 110	3.8
87/88	10 285	2.5	11 381	2.1	700	2.9	500	19.0	318	-	23 164	2.6	11 988	0.5	35 089	1.9	4 821	13.1	39 850	2.0	7 280	2.1
1988/89	10 536	2.4	11 644	2.2	722	3.1	660	32.0	318	-	23 850	3.0	12 475	4.0	36 325	3.6	4 723	13.0	41 000	3.5	7 500	3.3
89/90	10 748	2.3	11 882	2.2	743	2.9	800	21.2	318	-	24 569	2.8	12 836	2.9	37 344	2.8	4 846	13.0	42 150	2.8	7 700	2.7
90/91	10 972	2.1	12 174	2.5	766	3.1	950	18.8	318	-	25 180	2.7	13 230	3.2	38 430	2.9	4 980	13.0	43 410	2.9	7 910	2.7
91/92	11 183	1.9	12 466	2.4	788	2.9	1 230	29.5	318	-	25 885	3.2	13 760	3.8	39 745	3.4	5 125	12.9	44 870	3.4	8 150	3.0
92/93	11 387	1.8	12 767	2.4	812	3.0	1 560	26.8	318	-	26 844	3.3	14 415	4.8	41 259	3.8	5 291	12.8	46 550	3.7	8 430	3.4
1993/94	11 606	1.9	13 151	3.0	836	3.0	1 840	17.9	318	-	27 751	3.4	14 996	4.0	42 746	3.6	5 484	12.8	48 200	3.5	8 710	3.3
1994/95	11 825		13 474		857		1 930		318	-	28 484		15 470		43 954		5 566		49 500		8 950	
95/96	12 196		13 880		880		2 020		318	-	29 304		15 970		45 274		5 725		51 000		9 220	
96/97	12 486		14 257		901		2 110		318	-	30 041		16 480		46 521		5 879		52 400		9 460	
97/98	12 762		14 610		924		2 320		318	-	30 934		17 010		47 944		6 064		54 000		9 740	
98/99	13 262		14 987		948		2 500		318	-	31 985		17 550		49 535		6 295		55 800		10 000	
1999/2000	13 440		15 395		973		2 600		318	-	32 696		18 110		50 806		6 394		57 200		10 300	
2000/01	13 707		15 861		998		2 700		318	-	33 884		18 690		52 574		6 626		58 900		10 600	
01/02	13 986		16 248		1 024		2 800		318	-	34 376		19 280		53 656		6 834		60 300		10 800	
02/03	14 297		16 673		1 049		2 910		318	-	35 247		19 910		55 157		6 943		62 100		11 100	
03/04	14 669		17 110		1 075		3 010		318	-	36 162		20 545		56 707		7 193		63 900		11 400	
Av. Annual Growth % 11 Yrs. 82/83-93/94	2.5		2.8		2.8		84.8		-		3.4		4.7		3.9				3.9		4.2	
10 Yrs. 83/84-93/94	2.4		2.7		2.5		5.0		-		2.7		3.2		2.9				2.9		2.7	
21 Yrs. 82/83-03/04	2.4		2.7		2.7		28.7		-		3.1		4.0		3.4				3.4		3.5	

NOTES:

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[a] Projected peak loads are based on normal weather conditions.
[b] Transmission Rate sales in 1975/76 abnormally depressed by approximately 1 400 GW.h as a direct result of 3 months pulp and paper strike.
[c] Transmission Rate sales in 1981/82 abnormally depressed by approximately 900 GW.h as a direct result of 1.5 months pulp and paper strike.

B. C. HYDRO
PROBABLE PROJECTIONS OF GROSS ELECTRIC POWER REQUIREMENTS
FISCAL YEARS - APRIL TO MARCH - 1982/83 - 1988/89
BASED ON NORMAL WINTER TEMPERATURES

(Includes all losses)[a]

TABLE 8-2

COMPONENT SYSTEMS	1982/83 ACTUAL		1983/84		1984/85		1985/86		1986/87		1987/88		1988/89		For Cold[c] Weather Increase Annual Peaks by (Prob: 1 Year in 10)	Av. Annual Growth % 6 Years 82/83 - 88/89 Normal Weather	
	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h		Peak MW	Energy GW.h
INTEGRATED SYSTEM																	
1. Mainland[b]	4 297.00[d]	24 488.04	4 640	26 010	4 930	27 580	5 370	29 190	5 560	30 435	5 690	31 090	5 890	32 250	6%	5.6	4.7
2. Vancouver Island[b]	1 889.00	6 916.18	1 370	7 520	1 430	7 875	1 490	8 180	1 510	8 280	1 530	8 380	1 570	8 610	6%	3.3	3.7
3. TOTAL INTEGRATED SYSTEM	5 588.00[e]	31 364.22[d]	6 010	33 530	6 360	35 455	6 860	37 370	7 070	38 715	7 220	39 470	7 460	40 860	6%	5.2	4.5
NON-INTEGRATED AREAS SYSTEMS:																	
4. Lardeau (Purchase)	.84	3.67	.90	4.00	1.01	4.15	1.04	4.30	1.07	4.45	1.10	4.60	1.13	4.75	9%	5.1	4.4
5. Bennett/Peace Dam (Purchase)	-	1.85	-	1.95	-	7.00	-	2.00	-	2.00	-	2.00	-	2.00	-	-	1.3
6. Kingcome-Tsitk (Purchase)	.84	2.27	.44	2.30	.26	1.35	.27	1.40	.29	1.45	.30	1.50	.32	1.60	8%	-	-
7. Campbell (Purchase)	.62	.19	.03	.20	.03	.20	.03	.20	.03	.20	.03	.20	.03	.20	8%	7.0	0.9
8. Crossnest (Purchase)	-	.25	-	.25	-	.25	-	.25	-	.25	-	.25	-	.25	-	-	-
9. Kelly Lake (Purchase)	-	.25	-	.30	-	.30	-	.30	-	.30	-	.30	-	.30	-	-	2.4
10. Hydrie	-	8.08	Included in Mainland Integrated System, November 1982													-	-
11. Fort Nelson	13.40	57.49	13.80	64.00	15.30	68.10	15.70	73.60	16.10	76.00	16.40	78.10	16.80	84.30	4%	3.8	6.6
12. Atlin	.61	2.48	.67	2.70	.72	2.90	.78	3.15	.84	3.40	.92	3.70	1.02	4.10	10%	8.9	8.7
13. Stewart	3.02	13.37	3.14	13.60	2.64	13.20	2.77	12.70	2.91	13.00	3.06	13.45	3.21	14.00	6%	1.0	0.6
14. Queen Lake	.72	3.05	.76	3.20	.80	3.35	.83	3.50	.87	3.65	.92	3.85	.99	4.15	10%	5.5	5.3
15. Atlin Extension	.28	1.03	.32	1.05	.33	1.10	.33	1.10	.35	1.15	.36	1.20	.38	1.25	10%	5.2	3.3
16. Telegraph Creek	.36	1.06	.37	1.10	.38	1.10	.40	1.15	.42	1.20	.43	1.25	.45	1.30	10%	3.8	3.5
17. QB-Kimsquit/Pt. Clements	3.40	18.43	3.72	18.90	3.80	19.30	3.88	19.70	3.96	20.10	4.05	20.60	4.17	21.20	9%	3.5	2.4
18. QB-Sandspit	3.50	17.73	4.03	18.00	4.12	18.40	4.16	18.60	4.23	18.90	4.30	19.20	4.41	19.70	9%	3.9	1.8
19. Bella Bella	1.88	7.74	2.03	8.20	2.08	8.40	2.13	8.60	2.21	8.90	2.28	9.20	2.38	9.60	9%	4.8	3.7
20. Bella Coola	2.33	10.97	2.69	11.90	2.78	12.30	2.87	12.70	2.96	13.10	3.05	13.50	3.16	14.00	10%	5.2	4.1
21. Anahim Lake	.57	2.28	.61	2.30	.62	2.35	.62	2.35	.64	2.40	.65	2.45	.66	2.50	10%	2.5	1.5
22. Tahtsa Lake	.26	.94	.27	.95	.28	1.00	.28	1.00	.30	1.05	.30	1.05	.31	1.10	10%	3.0	2.7
Vancouver Island:																	
23. Zeballos	.46	1.92	.46	1.95	.46	1.95	Included in Vancouver Island Integrated System, 1 April 1985								9%	-	-
24. Sayward	.66	3.14	.67	3.15	.70	3.30	.72	3.40	.74	3.50	.76	3.60	.78	3.70	9%	3.1	2.8
25. Ahousat	-	.58	Included in Vancouver Island Integrated System, 1 September 1982													-	-
26. TOTAL NON-INTEGRATED AREAS[f]	32.76	168.78	35.0	180.0	36.3	185.0	36.8	170.0	37.9	175.0	38.9	180.0	40.20	190.00	-	3.5	4.0[i]
27. TOTAL B. C. HYDRO[g]	5 827[h]	31 813.00[d]	6 050	33 690	6 400	35 620	6 900	37 540	7 110	38 890	7 260	39 650	7 500	41 050	-	5.2	4.5

Footnotes on following page.

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NOTES FOR TABLE 8-2

a Thermal station service amounting to 34.66 GW.h at Burrard, Port Mann, Georgia, Keogh and Prince Rupert thermal plants is included in "ACTUAL" total for fiscal year 1982/83. An allowance is included for such station service in the projections, assuming no extended operation of these plants occurs. Any extended operation would increase the requirement for station service.

b Mainland Integrated System projection includes WKP&L Co. Ltd. requirements. The 1982/83 actual requirement for WKP&L Co. Ltd. was 15.00 GW.h plus losses.

c The annual peaks forecasts for each component system and the total B. C. Hydro are based on normal winter temperatures. Under cold weather conditions, these peaks may be exceeded by the respective percentages shown with a probability of about one year in ten. Compound growth rates would change accordingly.

d Includes 0 MW for WKP&L Co. Ltd. Firm Requirement at time of Mainland Integrated Peak. However, the Maximum Peak for WKP&L Co. Ltd. Requirement was 50 MW on 8 December 1982 at 1800 hours.

e Maximum coincident peak which occurred on Total Integrated system on 7 December 1982. Includes 0 MW for WKP&L Co. Ltd. Firm Requirement at time of Coincident System Peak.

f Actual individual system and district peaks shown are the maximums which occurred during fiscal year 1982/83 and do not add to actual "Total B. C. Hydro". The "Actual Total B. C. Hydro" shown is the addition of the Integrated System coincident peak of 5 508 MW (December 1982) and December 1982 non-integrated districts' peaks (29.20 rounded to 29 MW).

g Forecast peak totals do not add exactly because of rounding.

h Vancouver Island gross peak and energy requirements include losses on the AC and DC underwater cables from the Mainland to Vancouver Island.

i The 6 year Average Annual Growth is based on a Non-integrated total of 150.12 GW.h. This total excludes McBride and Ahousat which were integrated during the 1982/83 fiscal year.

(GW.h) gigawatt hours - 1 million kilowatt hours

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TABLE 8-3

B. C. HYDRO
PROJECTIONS OF ELECTRIC GROSS LOAD REQUIREMENTS
INTEGRATED SYSTEM

	July 1983 Forecast										September 1982	
			Range of Probable Forecasts									
	Low		Probable Low		Probable		Probable High		High		Probable	
	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
Fiscal Year												
1981/82 (Actual)	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186	5 902	32 186
1982/83 (Actual)	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354	5 508	31 354
1983/84	5 700	31 750	5 800	32 345	6 010	33 530	6 120	34 140	6 310	35 235	6 430	34 150
1984/85	5 900	32 850	6 070	33 840	6 360	35 455	6 500	36 235	6 680	37 230	6 760	36 130
1985/86	6 020	32 750	6 470	35 240	6 860	37 370	7 090	38 630	7 280	39 620	7 030	37 875
1986/87	5 970	32 650	6 600	36 135	7 070	38 715	7 350	40 220	7 460	40 810	7 380	40 100
1987/88	6 150	33 550	6 740	36 830	7 220	39 470	7 620	41 610	7 780	42 500	7 620	41 920
1988/89	6 280	34 440	6 920	37 920	7 460	40 860	7 800	42 700	8 110	44 490	7 880	43 440
1989/90	6 370	34 940	7 070	38 720	7 660	41 990	8 040	44 090	8 420	46 180	8 140	45 120
1990/91	6 470	35 530	7 250	39 810	7 860	43 200	8 300	45 580	8 720	47 870	8 440	47 060
1991/92	6 590	36 320	7 490	41 200	8 100	44 650	8 690	47 870	9 110	50 150	8 830	49 330
1992/93	6 750	37 320	7 720	42 690	8 380	46 320	9 030	49 860	9 510	52 540	9 100	50 900
1993/94	6 880	38 110	7 930	43 980	8 660	47 960	9 370	51 940	9 890	54 820	9 340	52 600
11 Yr. Av. Ann. Growth % (1982/83-1993/94)	2.0	1.8	3.4	3.1	4.2	3.9	4.9	4.7	5.5	5.2	4.9	4.8
1994/95	7 000	38 700	8 130	44 900	8 910	49 200	9 670	53 500	10 340	57 000	9 740	54 400
1995/96	7 170	39 700	8 360	46 200	9 160	50 700	10 040	55 600	10 730	59 600	10 040	56 300
1996/97	7 270	40 300	8 530	47 200	9 400	52 100	10 330	57 300	11 230	62 000	10 340	58 200
1997/98	7 420	41 200	8 740	48 500	9 680	53 700	10 630	59 300	11 630	64 600	10 740	60 200
1998/99	7 570	42 100	8 980	49 900	9 940	55 500	11 030	61 500	12 120	67 300	11 140	62 200
1999/2000	7 710	42 900	9 190	51 100	10 230	56 900	11 430	63 300	12 520	69 700	11 440	64 200
2000/01	7 840	43 800	9 380	52 300	10 530	58 600	11 720	65 200	13 010	72 400	11 740	66 100
2001/02	7 970	44 600	9 610	53 700	10 730	60 200	12 020	67 000	13 410	74 900	12 140	68 100
2002/03	8 100	45 400	9 810	54 900	11 030	61 800	12 320	69 000	13 910	77 700	12 440	70 100
2003/04	8 250	46 400	10 030	56 400	11 330	63 600	12 720	71 200	14 310	80 500	12 840	72 100
10 Yr. Av. Ann. Growth % (1993/94-2003/04)	1.8	2.0	2.4	2.5	2.7	2.9	3.1	3.2	3.8	3.9	3.2	3.2
21 Yr. Av. Ann. Growth % (1982/83-2003/04)	1.9	1.9	2.9	2.8	3.5	3.4	4.1	4.0	4.7	4.6	4.1	4.0

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TABLE 8-4

B. C. HYDRO

VANCOUVER ISLAND INTEGRATED SYSTEM

1983 PROBABLE FORECAST OF ELECTRIC GROSS LOAD REQUIREMENTS WITH AND WITHOUT NATURAL GAS
(Includes all losses)

Fiscal Year	Vancouver Island Integrated System assuming Natural Gas on Island by 1986/87 (approved 1983 projection)		Vancouver Island Integrated System with no[a] Natural Gas (done for comparison purposes only)		Vancouver Island Integrated System additional requirements if Natural Gas not extended to Island	
	Peak (MW)	Energy (GW.h)	Peak (MW)	Energy (GW.h)	Peak (MW)	Energy (GW.h)
1982/83 (Actual)	1 289	6 916	1 289	6 916	-	-
1983/84	1 370	7 520	1 370	7 530	-	10
1984/85	1 430	7 875	1 430	7 890	-	15
1985/86	1 490	8 180	1 490	8 200	-	20
1986/87	1 510	8 280	1 520	8 360	10	80
1987/88	1 530	8 380	1 550	8 510	20	130
1988/89	1 570	8 610	1 600	8 800	30	190
1989/90	1 590	8 730	1 640	9 000	50	270
1990/91	1 620	8 900	1 690	9 240	70	340
1991/92	1 650	9 090	1 730	9 480	80	390
1992/93	1 690	9 310	1 780	9 740	90	430
1993/94	1 730	9 540	1 830	10 020	100	480
11 Yr. Av. Growth 1982/83:1993/94		3.0%		3.4%		
1994/95	1 750	9 680	1 870	10 210	120	530
1995/96	1 790	9 890	1 920	10 480	130	590
1996/97	1 830	10 100	1 970	10 740	140	640
1997/98	1 870	10 310	2 010	10 980	140	670
1998/99	1 900	10 470	2 050	11 170	150	700
1999/2000	1 930	10 590	2 080	11 310	150	720
2000/01	1 950	10 710	2 110	11 460	160	750
2001/02	1 980	10 840	2 140	11 610	160	770
2002/03	2 010	10 980	2 180	11 770	170	790
2003/04	2 040	11 130	2 210	11 940	170	810
21 Yr. Av. Growth 1982/83:2003/04		2.3%		2.6%		

[a] This assumption is based on no natural gas to Vancouver Island and limited conversion from oil to electricity i.e. no change in the present policy on Vancouver Island occurs.

TABLE 8-5

B. C. HYDRO

COMPARISON OF ACTUAL ENERGY REQUIREMENTS WITH PROBABLE FORECAST OF TOTAL GROSS REQUIREMENTS (%)**

	YEARS AFTER FORECAST										
	1	2	3	4	5	6	7	8	9	10	11
1963 (probable)	0.1	-3.5	-10.8	-17.3	-20.5	-24.8	-25.7	-28.1	-31.4	-35.6	-38.0
1964 (probable)	-1.6	-4.1	-7.6	-9.0	-14.4	-15.7	-18.1	-22.8	-27.6	-31.3	-30.3
1965 (probable)	-1.8	-4.4	-1.0	-3.6	-4.5	-6.6	-11.6	-18.5	-22.7	-22.4	-19.5
1966 (probable)	-0.1	2.7	2.0	-0.5	0.1	-5.6	N/A	N/A	N/A	N/A	N/A
1967 (probable)	0.4	0.2	1.3	-0.2	-3.8	-9.5	N/A	N/A	N/A	N/A	N/A
1968 (probable)	-1.6	-1.9	-0.4	-2.6	-8.4	-11.7	N/A	N/A	N/A	N/A	N/A
1969 (probable)	0.1	1.9	-0.9	-4.4	-9.0	-7.4	-2.8	-7.0	-7.1	-7.4	-3.0
1970 (single)	-0.8	4.2	1.8	1.3	5.6	12.1*	9.6*	11.4*	12.9*	19.6*	25.5*
1971 (single)	0.6	0.9	1.2	6.7	14.7	12.5*	15.0*	16.5*	23.8*	29.5*	35.7*
1972 (single)	-1.8	-1.4	2.8	12.1	11.1	14.4*	16.8*	23.9*	29.3*	35.6*	51.1*
1973 (single)	0.5	4.8	14.0	12.9	17.7	20.5*	29.5*	36.7*	43.5*	60.1*	
1974 (single)	-0.5	5.3	5.3	12.7	16.7	25.2*	31.2*	38.9*	56.3*		
1975 (single)	-0.6	2.2	5.0	9.9	18.6	26.1*	32.6*	49.1*			
1976 (probable)	0.7	3.4	4.7	11.3	18.5	24.8	37.2				
1977 (probable)	0.4	-0.8	2.3	5.1	7.3	19.0					
1978 (probable)	-1.4	2.0	2.8	5.3	16.7						
1979 (probable)	1.2	3.0	7.6	20.7							
1980 (probable)	0.9	5.6	18.5								
1981 (probable)	-0.1	14.7									
1982 (probable)	3.4										

* High forecast.

** Difference between forecast made 1 to 11 years prior to year indicated divided by actual. A negative sign indicates forecast is too low.

B. C. HYDRO

COMPARISON OF ACTUAL ENERGY REQUIREMENTS WITH PROBABLE FORECAST OF TOTAL GROSS REQUIREMENTS

TABLE 8-6

Fiscal Years: GW.h

FORECAST MADE	1968/69	1969/70	1970/71	1971/72	1972/73	1973/74	1974/75	1975/76	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
1969 (Probable)	[13 760]	14 900	16 415	17 761	19 486	20 428	21 662	22 890	24 166	25 560	27 162	29 061														
1970 (Single)		[14 901]	16 963	18 677	20 720	22 737	24 606	26 386*	28 498*	30 667*	33 131*	35,856*	39 102*													
1971 (Single)			[16 106]	18 064	20 524	22 729	24 960	27 007	29 257*	31 676*	34 189*	37 105*	40 341*	43 916*												
1972 (Single)				[17 930]	19 984	22 138	24 040	26 395	28 891	31 490*	34 277*	37 139*	40 297*	43 878*	47 601*											
1973 (Single)					[20 349]	22 572	24 507	26 836	29 337	32 417	35 353*	38 815*	42 590*	46 420*	50 460*	54 950*										
1974 (Single)						[22 456]	23 275	24 775	27 385	31 030	34 241	37 516*	40 891*	44 938*	49 261*	53 628*	58 590*									
1975 (Single)							[21 394]	23 392	26 580	29 910	32 240	35 540	39 290*	42 920*	46 990*	51 500*	56 330*	61 280*								
1976 (Probable)								[23 538]	26 180	29 470	30 730	33 350	36 930	40 380	43 240	46 320	49 640	53 310	57 450							
1977 (Probable)									[25 996]	27 640	29 120	30 670	32 760	34 710	37 500	40 190	42 950	45 690	48 890	52 340						
1978 (Probable)										[27 536]	28 950	30 560	32 040	34 060	36 770	40 110	42 920	45 550	48 340	51 240	54 350					
1979 (Probable)											[29 340]	30 320	32 080	34 020	38 030	41 350	43 290	45 310	47 520	49 770	52 190	54 810				
1980 (Probable)												[29 973]	31 450	34 160	37 340	40 510	43 690	46 010	48 250	51 130	53 150	55 170	57 580			
1981 (Probable)													[31 150]	32 340	36 160	38 690	41 540	43 690	46 160	48 410	50 390	52 670	54 770	57 090		
1982 (Probable)														[32 359]	32 570	34 320	36 310	38 060	40 290	42 120	43 650	45 340	47 290	49 570	51 150	
1983 (Probable)															[31 513]	33 690	35 620	37 540	38 890	39 650	41 050	42 190	43 410	44 870	46 550	48 200
[ ] - Actual																										
Annual % Growth		8.4%	8.1	11.3%	13.5%	10.4%	4.2%	0.6%	10.4%	5.9%	6.6%	2.1%	4.0%	3.9%	-2.6%											
* - High Forecast																										

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PART NINE

ELECTRIC GROSS REQUIREMENTS - SENSITIVITY TO PROBABLE

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PART NINE

ELECTRIC GROSS REQUIREMENTS - SENSITIVITY TO PROBABLE

9.1 Introduction

The 1983 Load Forecast presents a range of electric gross requirement forecasts. The first range, to be detailed in this Part, is a sensitivity about the probable forecast, and it relies on the probable economic outlook contained in the Long Term Economic Outlook (LTEO). This sensitivity analysis is a new feature of the Load Forecast.

In addition to the sensitivity analysis, low and high forecasts of electric energy requirements are presented in Part 10 based, respectively, on the low and high economic outlooks in the LTEO.

An examination of previous B. C. Hydro Load Forecasts indicates that differences between forecast and actual electricity requirements result from unpredicted changes in the relative electricity use for a given level of GDP and from unpredicted changes in GDP. The variations in the load that might occur with the probable economic outlook are addressed in this part.

9.2 Sensitivity to Probable Electric Gross Requirements Forecast

In each electricity load category, changes are made to reflect different electric energy use that might occur without materially altering the economic variables contained in the probable LTEO. The basis of the changes are presented on TABLE 9-1, and the results are shown on TABLE 9-2 together with the probable forecast. Detail by sales categories are shown on TABLES 9-3 and 9-4.

In both the probable-low and probable-high forecasts, the variances in gross requirements and projected sales from the probable forecast in 1993/94 and 2003/04 are:

- total gross requirements vary in 1993/94 by 4000 GW.h or 8% of the probable forecast in both the low and the high case, and in 2003/04 by 7200 GW.h or 11% in the low case and 7700 GW.h or 12% in the high case.

- total sales requirements vary in 1993/94 by about 3550 GW.h in both the low and the high case, and in 2003/04 by about 6400 GW.h in the low case and 6800 GW.h in the high case. For 1993/94 the sales variations for the major categories are:

    - the residential category varies from probable by about 650 GW.h on the low side and 750 GW.h on the high side. About 25% of this variance is due to changes in the rate of household formation, 40% to changes in the electricity space heating capture rate and 35% to changes in the "other" unspecified load increase;

- the general category varies by about 1300 GW.h on the low side and 1350 GW.h on the high side. It is important to note that the variances are due to changes in the relative intensity of electricity use, such as building lighting design and business machine use;

- the transmission rate category varies from the probable by about 1000 GW.h in either direction. This variance would result from more or less electric intensive industry. For example, more investment in CTMP and LNG could cause more electricity requirements, while less investment in CTMP could reduce requirements; and

- the WKP&L load varies in 1993/94 by 500 GW.h on the low side and 550 GW.h on the high side. This relatively high variance on a probable load of 1840 GW.h in 1993/94 reflects the fact that B. C. Hydro only supplies WKP&L's incremental load requirements and would absorb all the variations from the forecast load.

In all cases, losses are calculated as the same proportion of total residential, general, transmission rate and other loads as in the probable case.

TABLE 9-1

SENSITIVITY CHANGES IN PROBABLE ELECTRICITY REQUIREMENT FORECAST

CASE:	PROBABLE - LOW	PROBABLE - HIGH
CATEGORY/VARIABLE:		
RESIDENTIAL		
- Population (as per LTEO)	central (probable)	central (probable)
- Headship Rate	slower household formation	faster household formation
- Electricity Space Heating capture rate	lowered 12 percentage points	raised 12 percentage points
- "Other" Electricity use not specifically identified	rises to 1500 kW.h/dwelling in 2003/04 (rises to 1900 in probable)	rises to 2500 kW.h/dwelling in 2003/04
GENERAL - INDUSTRIAL		
- Wood manufacturing	modest reduction in North American housing starts 25% less electricity intensity in new loads	modest increase in North American housing starts 25% more electricity intensity in new loads
- Remainder		
GENERAL - COMMERCIAL		
- Retail, office, accomodation and food service	additional conservation varying for each sector	less conservation varying for each sector
- Remainder	additional conservation at 1% per year	greater electricity use rate at 1% per year
TRANSMISSION RATE		
- Short term	modest strike (1 month)	faster recovery
- Long term	less investment in electric intensive industry	greater investment in electric intensive industry
OTHER	for each forecast, varied in proportion to the sum of residential, general and transmission rate loads.	
WKP&L	for each forecast, total WKP&L and Cominco load is varied in proportion to the sum of B. C. Hydro's residential, general, transmission rate and other loads. Local generation is deducted to determine B. C. Hydro supply requirements.	
SEATTLE CITY LIGHT	for each forecast, maintained as in the probable.	

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TABLE 9-2

B. C. HYDRO
PROJECTIONS OF ELECTRIC GROSS LOAD REQUIREMENTS
PROBABLE LOW AND PROBABLE HIGH
TOTAL B. C. HYDRO

	July 1983 Forecast					
	Range of Probable Forecasts					
	Probable Low		Probable		Probable High	
Fiscal Year	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
1981/82 (Actual)	5 939	32 359	5 939	32 359	5 939	32 359
1982/83 (Actual)	5 537	31 513	5 537	31 513	5 537	31 513
1983/84	5 830	32 500	6 050	33 690	6 160	34 300
1984/85	6 110	34 000	6 400	35 620	6 540	36 400
1985/86	6 510	35 400	6 900	37 540	7 130	38 800
1986/87	6 640	36 300	7 110	38 890	7 390	40 400
1987/88	6 780	37 000	7 260	39 650	7 660	41 800
1988/89	6 960	38 100	7 500	41 050	7 840	42 900
1989/90	7 110	38 900	7 700	42 190	8 090	44 300
1990/91	7 290	40 000	7 910	43 410	8 350	45 800
1991/92	7 530	41 400	8 150	44 870	8 740	48 100
1992/93	7 770	42 900	8 430	46 550	9 080	50 100
1993/94	7 980	44 200	8 710	48 200	9 430	52 200
11 Yr. Av. Ann. Growth % (1982/83-1993/94)	3.4	3.1	4.2	3.9	5.0	4.7
1994/95	8 180	45 200	8 960	49 500	9 730	53 800
1995/96	8 410	46 500	9 220	51 000	10 100	55 900
1996/97	8 580	47 500	9 460	52 400	10 400	57 600
1997/98	8 800	48 800	9 740	54 000	10 700	59 600
1998/99	9 040	50 200	10 000	55 800	11 100	61 800
1999/2000	9 250	51 400	10 300	57 200	11 500	63 600
2000/01	9 440	52 600	10 600	58 900	11 800	65 500
2001/02	9 680	54 000	10 800	60 500	12 100	67 400
2002/03	9 880	55 200	11 100	62 100	12 400	69 400
2003/04	10 100	56 700	11 400	63 900	12 800	71 600
10 Yr. Av. Ann. Growth % (1993/94-2003/04)	2.4	2.5	2.7	2.9	3.1	3.2
21 Yr. Av. Ann. Growth % (1982/83-2003/04)	2.9	2.8	3.5	3.4	4.1	4.0

TABLE 9-3

B. C. HYDRO
HISTORIC AND PROBABLE LOW PROJECTIONS OF ELECTRIC POWER REQUIREMENTS
BY SALES CATEGORIES

Fiscal Year	Residential (GW.h)	General (GW.h)	Trans Rate (GW.h)	Other (GW.h)	Total Res, Gen, Trans Rt & Other (GW.h)	MEPOL (GW.h)	Seattle City Light (GW.h)	Total Billed Sales (GW.h)	Losses & Accruals (GW.h)	Total Gross Requirements (GW.h)	Peak (MW)
HISTORIC											
1972/73	4 739	5 859	7 086	483	17 917			17 917	2 432	20 349	3 653
1973/74	5 176	6 370	7 776	470	19 800			19 800	2 656	22 456	3 739
1974/75	5 685	6 885	7 714	495	20 579			20 579	2 815	23 394	3 957
1975/76	6 258	7 862	6 888[a]	532	20 660			20 660	2 878	23 538	4 232
1976/77	6 625	7 982	8 166	541	22 924			22 924	3 072	25 996	4 421
1977/78	7 881	8 073	8 479	561	24 164			24 164	3 372	27 536	4 800
1978/79	7 482	8 512	9 133	593	25 720			25 720	3 628	29 348	5 122
1979/80	7 727	8 949	9 217	625	26 518			26 518	3 455	29 973	5 231
1980/81	8 042	9 344	9 597	581	27 564			27 564	3 594	31 158	5 511
1981/82	8 640	9 706	9 339[a]	609	28 294	14		28 308	4 051	32 359	5 939
1982/83	8 821	9 704	9 046	620	28 191	15		28 206	3 307	31 513	5 537
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	6.4	5.5	2.5	3.2	4.6	-		4.6	-	4.5	4.2
PROJECTIONS											
1983/84	9 015	9 775	9 300	622	28 712	-	-	28 712	3 788	32 500	5 830
1984/85	9 229	9 955	10 200	625	30 009	-	-	30 009	3 991	34 000	6 110
1985/86	9 462	10 164	10 980	628	31 154	-	136	31 290	4 110	35 400	6 510
1986/87	9 659	10 364	11 100	644	31 767	-	318	32 085	4 215	36 300	6 640
1987/88	9 854	10 542	11 200	660	32 256	120	318	32 694	4 306	37 000	6 780
1988/89	10 048	10 748	11 700	678	33 174	200	318	33 692	4 408	38 100	6 960
1989/90	10 233	10 945	12 000	695	33 873	270	318	34 461	4 439	38 900	7 110
1990/91	10 482	11 165	12 400	714	34 681	370	318	35 369	4 631	40 000	7 290
1991/92	10 556	11 374	12 900	732	35 562	810	318	36 690	4 710	41 400	7 530
1992/93	10 700	11 612	13 500	752	36 564	1 110	318	37 992	4 908	42 900	7 770
1993/94	10 848	11 862	14 000	772	37 482	1 360	318	39 160	5 040	44 200	7 980
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	1.9	1.8	4.1	2.0	2.6	-	-	3.0	-	3.1	3.4
1994/95	11 047	12 079	14 400	788	38 314	1 410	318	40 042	5 158	45 200	8 180
1995/96	11 243	12 359	14 900	806	39 308	1 640	318	41 266	5 234	46 500	8 410
1996/97	11 435	12 606	15 300	822	40 163	1 690	318	42 171	5 329	47 500	8 580
1997/98	11 646	12 844	15 800	840	41 130	1 860	318	43 308	5 492	48 800	8 800
1998/99	11 949	13 098	16 300	859	42 206	2 000	318	44 524	5 676	50 200	9 040
1999/2000	12 144	13 352	16 800	879	43 175	2 070	318	45 563	5 837	51 400	9 250
2000/01	12 362	13 686	17 300	899	44 247	2 130	318	46 695	5 905	52 600	9 440
2001/02	12 586	13 946	17 900	919	45 351	2 210	318	47 879	6 121	54 000	9 680
2002/03	12 834	14 232	18 400	939	46 405	2 280	318	49 003	6 197	55 200	9 880
2003/04	13 115	14 526	19 000	959	47 600	2 360	318	50 278	6 422	56 700	10 100
Av. Ann. Growth: % 10 Yrs: 93/94-03/04	1.9	2.0	3.1	2.2	2.4	5.7	-	2.5	-	2.5	2.4
% 21 Yrs: 82/83-03/04	1.9	1.9	3.6	2.1	2.5	-	-	2.8	-	2.8	2.9

[a] There were forestry industry strikes in 1975/76 and 1981/82 causing reductions in Transmission Rate sales.

TABLE 9-4

B. C. HYDRO
HISTORIC AND PROBABLE HIGH PROJECTIONS OF ELECTRIC POWER REQUIREMENTS
BY SALES CATEGORIES

Fiscal Year	Residential (GW.h)	General (GW.h)	Trans Rate (GW.h)	Other (GW.h)	Total Res, Gen, Trans Rt & Other (GW.h)	WKPAL (GW.h)	Seattle City Light (GW.h)	Total Billed Sales (GW.h)	Losses & Accruals (GW.h)	Total Gross Requirements (GW.h)	Peak (MW)
HISTORIC											
1972/73	4 730	5 650	7 086	453	17 917			17 917	2 432	20 349	3 683
1973/74	5 176	6 378	7 776	470	19 800			19 800	2 656	22 456	3 739
1974/75	5 685	6 685	7 714	495	20 579			20 579	2 815	23 394	3 957
1975/76	6 258	7 862	6 808[a]	532	20 660			20 660	2 878	23 538	4 232
1976/77	6 625	7 982	8 186	541	22 984			22 984	3 072	25 986	4 421
1977/78	7 051	8 073	8 479	561	24 164			24 164	3 372	27 536	4 880
1978/79	7 492	8 512	9 133	583	25 720			25 720	3 628	29 348	5 122
1979/80	7 727	8 949	9 217	625	26 518			26 518	3 455	29 973	5 231
1980/81	8 042	9 344	9 597	581	27 564			27 564	3 594	31 158	5 511
1981/82	8 640	9 706	9 339[a]	609	28 294	14		28 308	4 051	32 359	5 939
1982/83	8 821	9 704	9 046	620	28 191	15		28 206	3 307	31 513	5 537
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	6.4	5.5	2.5	3.2	4.6	-		4.6	-	4.5	4.2
PROJECTIONS											
1983/84	9 354	10 148	10 000	642	30 144	120	-	30 264	4 036	34 300	6 160
1984/85	9 658	10 678	11 000	662	31 998	180	-	32 178	4 222	36 400	6 540
1985/86	9 989	11 318	11 900	683	33 890	260	136	34 286	4 514	38 800	7 130
1986/87	10 290	11 775	12 200	706	34 971	420	318	35 709	4 691	40 400	7 390
1987/88	10 591	12 108	12 500	731	35 930	690	318	36 938	4 862	41 800	7 660
1988/89	10 888	12 460	12 800	758	36 906	770	318	37 994	4 906	42 900	7 840
1989/90	11 174	12 823	13 200	784	37 981	900	318	39 199	5 101	44 300	8 090
1990/91	11 444	13 222	13 700	812	39 178	1 050	318	40 546	5 254	45 800	8 350
1991/92	11 699	13 613	14 500	839	40 651	1 620	318	42 589	5 511	48 100	8 740
1992/93	11 951	14 034	15 200	868	42 053	2 000	318	44 371	5 729	50 100	9 080
1993/94	12 226	14 472	16 000	898	43 596	2 370	318	46 284	5 916	52 200	9 430
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	3.0	3.7	5.3	3.4	4.0	-	-	4.6	-	4.7	5.0
1994/95	12 569	14 918	16 500	924	44 911	2 490	318	47 719	6 081	53 800	9 730
1995/96	12 925	15 492	17 100	952	46 469	2 820	318	49 607	6 293	55 900	10 100
1996/97	13 289	15 999	17 600	978	47 866	2 950	318	51 134	6 466	57 600	10 400
1997/98	13 679	16 486	18 200	1 006	49 371	3 200	318	52 889	6 711	59 600	10 700
1998/99	14 255	17 007	18 800	1 035	51 097	3 440	318	54 855	6 945	61 800	11 100
1999/2000	14 532	17 529	19 400	1 065	52 526	3 560	318	56 404	7 196	63 600	11 500
2000/01	14 843	18 214	20 000	1 095	54 152	3 690	318	58 160	7 340	65 500	11 800
2001/02	15 173	18 748	20 600	1 127	55 648	3 820	318	59 786	7 614	67 400	12 100
2002/03	15 540	19 335	21 300	1 158	57 333	3 960	318	61 611	7 789	69 400	12 400
2003/04	15 954	19 938	22 000	1 190	59 082	4 090	318	63 490	8 110	71 600	12 800
Av. Ann. Growth: % 10 Yrs: 93/94-03/04	2.7	3.3	3.2	2.9	3.1	5.6	-	3.2	-	3.2	3.1
% 21 Yrs: 82/83-03/04	2.9	3.5	4.3	3.2	3.6	-	-	3.9	-	4.0	4.1

[a] There were forestry industry strikes in 1975/76 and 1981/82 causing reductions in Transmission Rate sales.

PART TEN

ELECTRIC-GROSS REQUIREMENTS - LOW AND HIGH PROJECTIONS

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PART TEN

ELECTRIC-GROSS REQUIREMENTS - LOW AND HIGH PROJECTIONS

10.1 Introduction

Part Nine of this report shows the variation in electric load growth that could occur with the probable economic outlook remaining relatively unchanged. This section of the report details the 'probable' electric forecast expected to occur if the low and high economic forecasts were to occur.

10.2 Low and High Electric Gross Requirements

In addition to the central or probable economic forecast, the Long-Term Economic Outlook (LTEO) has low and high forecasts for B. C. which are used to develop low and high electric gross requirements. TABLE 10-1 presents the changes made from the probable electricity requirements, and TABLES 10-2 and 10-3 show the key economic indicators for the pessimistic and optimistic cases, respectively.

The low economic outlook, characterized in the LTEO as "economic decline", contemplates world trade disruptions and very poor economic performance. In B. C., real economic activity would not reach the level achieved in 1981 until 1989 with reductions in GDP during 1985 and 1986 after the current recovery stalls. After 1987, real B. C. GDP growth would average 2.5% annually, however net-migration, population and labor force estimates would still not prevent the unemployment rate rising above the probable case.

The high economic outlook characterized in the LTEO as "approaching potential output", contemplates a faster recovery than the probable case and more sustained growth in the long term. More housing starts, especially in the U.S., and increased international trade in products from B. C. cause GDP to exceed the 1981 level in 1984. Better job prospects increase net migration, causing population, labour force and employment to rise. The unemployment rate would drop below the probable case.

For both the low and high electric energy requirements, shown on TABLE 10-4 along with the probable forecast, the variances in gross requirements and projected sales from the probable forecast are:

- total gross requirements vary in 1993/94 by 9 900 GW.h or 24% on the low side and 6 900 GW.h or 14% on the high side, and in 2003/04 by about 17 000 GW.h or 27% of the probable forecast for both the low and high case.

- total sales requirements vary in 1993/94 by about 8 800 GW.h on the low side and 6 100 GW.h on the high side, and in 2003/04 by about 15 000 GW.h for both the low and high case. For 1993/94 the sales variations for the major categories are;

- the residential category varies from probable by 900 on the low side and by 1 000 GW.h on the high side. Of the total residential variance, between 70% and 80% is due to the probable-low and probable-high changes in household formation rates, electric space heating capture rate and changes in the "other" electric use, and the remainder are due to changes in population;

- the general category varies by 3 000 GW.h on the low side and 1 900 GW.h on the high side. Large differences in the low and high GDP forecasts cause the general electricity requirements to vary considerably;

- the transmission rate category varies from probable by about 3 400 GW.h on the low side and 2 400 GW.h on the high side. The major cause of these variances is the difference in GDP forecasts which cause wide differences in industrial activity levels; and

- the WKP&L load varies by 1 200 GW.h on the low side and 900 GW.h on the high side. The magnitude of the variances results from the marginal nature of B. C. Hydro's supply which makes up the difference between total WKP&L load and local generation.

In all cases, losses are calculated as the same proportion of total residential, general, transmission rate and other loads as in the probable case. Details of all sales by component are shown in TABLES 10-5 and 10-6.

Although the low and high electricity requirements forecasts are based on their respective GDP estimates, they are also based in large measure on the electric intensity of the probable case. As shown by the probable-low and probable-high electricity requirements forecasts in Part Nine, a significant variance in electricity requirements can occur due to changes in the electric intensity of a given GDP forecast. Further, the economic conditions which prevail in the low and high cases may result in substantially different behavior from the probable case and cause discontinuities in electricity use. This is a particular concern in the low forecast where the economy is very poor for an extended period of time, and behaviour may not be directly proportional to the probable case.

TABLE 10-1
LOW AND HIGH CHANGES IN PROBABLE ELECTRICITY REQUIREMENT FORECAST

CASE:	LOW	HIGH
CATEGORY/VARIABLE:		
RESIDENTIAL		
- Population (as per LTEO)	pessimistic	optimistic
- Headship Rate	as per probable - low	as per probable - high
- Electricity Space Heating capture rate	as per probable - low	as per probable - high
- "Other" Electricity use not specifically identified	rises to 1500 kW.h/dwelling as per probable - low	rises to 2500 kW.h/dwelling as per probable - high
GENERAL - INDUSTRIAL		
- Wood manufacturing	strike in short term, and in proportion to low/probable GDP	faster recovery and maintenance of high U. S. housing starts
- Remainder	in proportion to low/probable GDP	in proportion to high/probable GDP
GENERAL - COMMERCIAL		
- Retail, office, accomodation and food service	use low GDP in floor space model with probable electric use rates	use high GDP in floor space model with probable electric use rates
- Remainder	in proportion to low/probable GDP	in proportion to high/probable GDP
TRANSMISSION RATE		
- Short term	major strike, and low capacity utilization in key industries	faster recovery and greater investment in new capacity
- Long term	in proportion to low/probable GDP after 1986	in proportion to high/probable GDP after 1987
OTHER	for each forecast, varied in proportion to the sum of residential, general and transmission rate loads.	
WKP&L	for each forecast, total WKP&L and Cominco load is varied in proportion to the sum of B. C. Hydro's residential, general, transmission rate and other loads. Local generation is deducted to determine B. C. Hydro supply requirements.	
SEATTLE CITY LIGHT	for each forecast, maintained as in the probable.	

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TABLE 10-2

KEY INDICATORS

B. C. LOW ECONOMIC GROWTH FORECAST

Economic Decline

	1982	1983	1984	1985	1986	1987	1987-92	1992-2002
REAL GDP (Billions of 1971 $)	15.4[a]	15.5	15.9	15.5	14.9	15.4	17.4[b]	22.3[b]
REAL GDP (% Change)	-7.0[a]	0.5	2.5	-2.0	-4.0	3.0	2.5	2.5
INFLATION								
(GDP Deflator % Change)	10.5	6.5	5.0	3.5	2.0	2.0	5.0	5.0
(Vancouver - CPI % Change)	10.5	6.0	5.0	3.0	2.5	2.5	4.5	4.5
POPULATION								
(Thousands)	2,783	2,815	2,859	2,909	2,963	3,019	3,302[b]	3,884[b]
(% Change)	1.4	1.2	1.5	1.7	1.9	1.9	1.8	1.6
HOUSING STARTS (Thousands)	20	24	29	21	15	23	23[b]	23[b]
LABOUR FORCE (Thousands)	1,346	1,375	1,412	1,448	1,479	1,509	1,663[b]	2,058[b]
UNEMPLOYMENT RATE (%)	12.1	14.5	13.0	16.0	17.0	14.0	10.0	10.0

[a] Estimated.
[b] Value for the last year of the period shown.

TABLE 10-3

KEY INDICATORS

B. C. HIGH ECONOMIC GROWTH FORECAST

Approaching Potential Output

	1982	1983	1984	1985	1986	1987	1987-92	1992-2002
REAL GDP (Billions of 1971 $)	15.4[a]	15.9	17.2	18.6	19.6	20.3	25.5[b]	40.4[b]
REAL GDP (% Change)	-7.0[a]	3.2	8.0	8.5	5.5	3.5	4.7	4.7
INFLATION								
(GDP Deflator % Change)	10.5	6.5	7.0	8.0	7.5	7.5	8.0	8.0
(Vancouver - CPI % Change)	10.5	6.0	6.5	7.5	7.0	7.0	7.5	7.5
POPULATION								
(Thousands)	2,783	2,819	2,872	2,935	3,001	3,070	3,445[b]	4,265[b]
(% Change)	1.4	1.3	1.9	2.2	2.3	2.3	2.3	2.2
HOUSING STARTS (Thousands)	20	30	37	38	34	30	45[b]	45[b]
LABOUR FORCE (Thousands)	1,346	1,379	1,420	1,463	1,501	1,537	1,741[b]	2,266[b]
UNEMPLOYMENT RATE (%)	12.1	12.5	10.5	9.0	8.0	7.5	6.0	6.0

[a] Estimated.
[b] Value for the last year of period shown.

TABLE 10-4

B. C. HYDRO
PROJECTIONS OF ELECTRIC GROSS LOAD REQUIREMENTS
LOW AND HIGH PROJECTIONS
TOTAL B. C. HYDRO

	July 1983 Forecast					
	Low		Probable		High	
Fiscal Year	Peak MW	Energy GW.h	Peak MW	Energy GW.h	Peak MW	Energy GW.h
1981/82 (Actual)	5 939	32 359	5 939	32 359	5 939	32 359
1982/83 (Actual)	5 537	31 513	5 537	31 513	5 537	31 513
1983/84	5 730	31 900	6 050	33 690	6 350	34 400
1984/85	5 930	33 000	6 400	35 620	6 720	37 400
1985/86	6 050	32 900	6 900	37 540	7 320	39 800
1986/87	6 000	32 800	7 110	38 890	7 500	41 000
1987/88	6 180	33 700	7 260	39 650	7 820	42 700
1988/89	6 320	34 600	7 500	41 050	8 160	44 700
1989/90	6 410	35 100	7 700	42 190	8 470	46 400
1990/91	6 510	35 700	7 910	43 410	8 770	48 100
1991/92	6 630	36 500	8 150	44 870	9 160	50 400
1992/93	6 790	37 500	8 430	46 550	9 570	52 800
1993/94	6 920	38 300	8 710	48 200	9 950	55 100
11 Yr. Av. Ann. Growth % (1982/83-1993/94)	2.0	1.8	4.2	3.9	5.5	5.2
1994/95	7 040	38 900	8 960	49 500	10 400	57 300
1995/96	7 220	39 900	9 220	51 000	10 800	59 900
1996/97	7 320	40 500	9 460	52 400	11 300	62 300
1997/98	7 470	41 400	9 740	54 000	11 700	64 900
1998/99	7 620	42 300	10 000	55 800	12 200	67 700
1999/2000	7 760	43 100	10 300	57 200	12 600	70 100
2000/01	7 900	44 000	10 600	58 900	13 100	72 800
2001/02	8 030	44 800	10 800	60 500	13 500	75 300
2002/03	8 160	45 600	11 100	62 100	14 000	78 100
2003/04	8 310	46 600	11 400	63 900	14 400	80 900
10 Yr. Av. Ann. Growth % (1993/94-2003/04)	1.8	2.0	2.7	2.9	3.8	3.9
21 Yr. Av. Ann. Growth % (1982/83-2003/04)	2.0	1.9	3.5	3.4	4.7	4.6

TABLE 10-5

B. C. HYDRO
HISTORIC AND LOW PROJECTIONS OF ELECTRIC POWER REQUIREMENTS
BY SALES CATEGORIES

Fiscal Year	Residential (GW.h)	General (GW.h)	Trans Rate (GW.h)	Other (GW.h)	Total Res, Gen, Trans Rt & Other (GW.h)	WKPGL (GW.h)	Seattle City Light (GW.h)	Total Billed Sales (GW.h)	Losses & Accruals (GW.h)	Total Gross Requirements (GW.h)	Peak (MW)
HISTORIC											
1972/73	4 739	5 659	7 066	453	17 917			17 917	2 432	20 349	3 653
1973/74	5 176	6 378	7 776	470	19 800			19 800	2 656	22 456	3 739
1974/75	5 686	6 685	7 714	495	20 579			20 579	2 815	23 394	3 957
1975/76	6 258	7 062	6 808[a]	532	20 660			20 660	2 878	23 538	4 232
1976/77	6 625	7 592	8 166	541	22 924			22 924	3 072	25 996	4 421
1977/78	7 051	8 073	8 479	561	24 164			24 164	3 372	27 536	4 800
1978/79	7 492	8 512	9 133	583	25 720			25 720	3 628	29 348	5 122
1979/80	7 727	8 949	9 217	625	26 518			26 518	3 455	29 973	5 231
1980/81	8 042	9 344	9 597	581	27 564			27 564	3 594	31 158	5 511
1981/82	8 640	9 706	9 339[a]	609	28 294	14		28 308	4 051	32 359	5 939
1982/83	8 821	9 704	9 046	620	28 191	15		28 206	3 307	31 513	5 537
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	6.4	5.5	2.5	3.2	4.6	-		4.6	-	4.5	4.2
PROJECTIONS											
1983/84	9 010	9 771	8 800	602	28 183	-	-	28 183	3 717	31 900	5 730
1984/85	9 213	9 824	9 500	600	29 137	-	-	29 137	3 863	33 000	5 930
1985/86	9 432	9 419	9 500	583	28 934	-	136	29 070	3 830	32 900	6 050
1986/87	9 616	8 918	9 600	594	28 728	-	318	29 046	3 754	32 800	6 000
1987/88	9 797	9 302	9 800	605	29 504	-	318	29 822	3 878	33 700	6 180
1988/89	9 972	9 471	10 200	617	30 260	-	318	30 578	4 022	34 600	6 320
1989/90	10 134	9 595	10 480	629	30 758	-	318	31 076	4 024	35 100	6 410
1990/91	10 277	9 740	10 600	642	31 259	-	318	31 577	4 123	35 700	6 510
1991/92	10 399	9 839	10 900	654	31 792	210	318	32 320	4 180	36 500	6 630
1992/93	10 509	9 972	11 300	667	32 448	440	318	33 206	4 294	37 500	6 790
1993/94	10 622	10 112	11 600	680	33 014	620	318	33 952	4 348	38 300	6 920
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	1.7	0.4	2.3	0.8	1.4	-	-	1.7	-	1.8	2.0
1994/95	10 785	10 274	11 800	691	33 550	630	318	34 498	4 402	38 900	7 040
1995/96	10 944	10 483	12 100	702	34 229	800	318	35 347	4 553	39 900	7 220
1996/97	11 100	10 668	12 300	713	34 781	820	318	35 919	4 581	40 500	7 320
1997/98	11 272	10 846	12 600	725	35 443	930	318	36 691	4 709	41 400	7 470
1998/99	11 536	11 036	12 900	737	36 209	1 020	318	37 547	4 753	42 300	7 620
1999/2000	11 692	11 226	13 200	750	36 868	1 060	318	38 246	4 854	43 100	7 760
2000/01	11 871	11 475	13 500	763	37 609	1 080	318	39 007	4 993	44 000	7 900
2001/02	12 055	11 670	13 800	776	38 301	1 120	318	39 739	5 061	44 800	8 030
2002/03	12 263	11 804	14 100	789	39 036	1 150	318	40 504	5 096	45 600	8 160
2003/04	12 504	12 104	14 400	802	39 810	1 180	318	41 308	5 292	46 600	8 310
Av. Ann. Growth: % 10 Yrs: 93/94-03/04	1.6	1.8	2.2	1.7	1.9	6.6	-	2.0	-	2.0	1.8
% 21 Yrs: 82/83-03/04	1.7	1.1	2.2	1.2	1.7	-	-	1.8	-	1.9	2.0

[a] There were forestry industry strikes in 1975/76 and 1981/82 causing reductions in Transmission Rate sales.

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TABLE 10-6

B. C. HYDRO
HISTORIC AND HIGH PROJECTIONS OF ELECTRIC POWER REQUIREMENTS
BY SALES CATEGORIES

Fiscal Year	Residential (GW.h)	General (GW.h)	Trans Rate (GW.h)	Other (GW.h)	Total Res, Gen, Trans Rt & Other (GW.h)	WKP&L (GW.h)	Seattle City Light (GW.h)	Total Billed Sales (GW.h)	Losses & Accruals (GW.h)	Total Gross Requirements (GW.h)	Peak (MW)
HISTORIC											
1972/73	4 739	5 659	7 066	453	17 917			17 917	2 432	20 349	3 653
1973/74	5 176	6 378	7 776	470	19 800			19 800	2 656	22 456	3 739
1974/75	5 685	6 685	7 714	495	20 579			20 579	2 815	23 394	3 957
1975/76	6 258	7 062	6 808[a]	532	20 660			20 660	2 878	23 538	4 232
1976/77	6 625	7 592	8 166	541	22 924			22 924	3 072	25 996	4 421
1977/78	7 051	8 073	8 479	561	24 164			24 164	3 372	27 536	4 800
1978/79	7 492	8 512	9 133	583	25 720			25 720	3 628	29 348	5 122
1979/80	7 727	8 949	9 217	625	26 518			26 518	3 455	29 973	5 231
1980/81	8 042	9 344	9 597	581	27 564			27 564	3 594	31 158	5 511
1981/82	8 640	9 706	9 339[a]	609	28 294	14		28 308	4 051	32 359	5 539
1982/83	8 821	9 704	9 046	620	28 191	15		28 206	3 307	31 513	5 537
Av. Ann. Growth: % 10 Yrs: 72/73-82/83	6.4	5.5	2.5	3.2	4.6	-		4.6	-	4.5	4.2
PROJECTIONS											
1983/84	9 361	10 158	10 900	664	31 083	120	-	31 203	4 197	35 400	6 350
1984/85	9 683	10 863	11 600	677	32 823	180	-	33 003	4 397	37 400	6 720
1985/86	10 035	11 538	12 500	701	34 774	260	136	35 170	4 630	39 800	7 320
1986/87	10 360	11 890	12 600	727	35 577	420	318	36 315	4 685	41 000	7 500
1987/88	10 685	12 338	12 900	755	36 678	800	318	37 796	4 904	42 700	7 820
1988/89	11 007	12 792	13 700	785	38 284	980	318	39 582	5 118	44 700	8 160
1989/90	11 317	13 201	14 300	814	39 632	1 150	318	41 100	5 300	46 400	8 470
1990/91	11 614	13 612	14 900	846	40 972	1 320	318	42 610	5 490	48 100	8 770
1991/92	11 896	14 065	15 600	877	42 438	1 910	318	44 666	5 734	50 400	9 160
1992/93	12 174	14 570	16 500	910	44 154	2 340	318	46 812	5 988	52 800	9 570
1993/94	12 477	15 011	17 400	943	45 831	2 740	318	48 889	6 211	55 100	9 950
Av. Ann. Growth: % 11 Yrs: 82/83-93/94	3.2	4.0	6.1	3.9	4.5	-	-	5.1	-	5.2	5.5
1994/95	12 849	15 556	18 200	977	47 582	2 920	318	50 820	6 480	57 300	10 400
1995/96	13 235	16 259	19 000	1 015	49 509	3 320	318	53 147	6 753	59 900	10 800
1996/97	13 629	16 879	19 900	1 049	51 457	3 530	318	55 305	6 995	62 300	11 300
1997/98	14 050	17 475	20 800	1 087	53 412	3 860	318	57 590	7 310	64 900	11 700
1998/99	14 658	18 112	21 700	1 126	55 596	4 170	318	60 084	7 616	67 700	12 200
1999/2000	14 967	18 750	22 600	1 167	57 484	4 360	318	62 162	7 938	70 100	12 600
2000/01	15 310	19 588	23 600	1 208	59 706	4 570	318	64 594	8 206	72 800	13 100
2001/02	15 671	20 242	24 600	1 251	61 764	4 770	318	66 852	8 448	75 300	13 500
2002/03	16 070	20 960	25 700	1 292	64 022	4 990	318	69 330	8 770	78 100	14 000
2003/04	16 517	21 698	26 700	1 335	66 250	5 180	318	71 748	9 152	80 900	14 400
Av. Ann. Growth: % 10 Yrs: 93/94-03/04	2.8	3.8	4.4	3.5	3.8	6.6	-	3.9	-	3.9	3.8
% 21 Yrs: 82/83-03/04	3.0	3.9	5.3	3.7	4.2	-	-	4.5	-	4.6	4.7

[a] There were forestry industry strikes in 1975/76 and 1981/82 causing reductions in Transmission Rate sales.

PART ELEVEN

GAS PROJECTIONS

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PART ELEVEN

GAS PROJECTIONS

11.1 Introduction

The gas service forecasts are presented in metric units. The basic unit of gas measurement in the metric system is the Joule (J). The metric unit adopted by B. C. Hydro for billing purposes is called the Billing Unit (BU) which is equal to 10^8 J or 0.1 GJ. The conversion of imperial units to the metric system is based on the relationship British Thermal Units (BTU) × 1 054.6 equals Joules.

During fiscal year 1982/83, B. C. Hydro's actual natural gas sales in the Lower Mainland of B. C. amounted to 684 637 000 BU of firm gas and 199 557 000 BU of interruptible gas. These volumes exclude pipeline losses and natural gas sold for thermal electric generation. Since most gas sold is used for space heating, and this load is very much affected by the weather experienced during the year, it is necessary to normalize natural gas sales in order to be able to make valid year-to-year sales comparisons. In addition to this normalization, sales volumes lost due to strikes are added back to the interruptible load and this load is also put on the basis of 30 days of curtailment, which is the standard used for planning purposes. On the basis of normalized sales, firm sales came to 706 350 000 BU and interruptible sales to 185 520 000 BU. This compares with normalized sales of 723 260 000 BU of firm gas and 214 965 000 BU of interruptible gas during fiscal year 1981/82. Therefore, firm gas sales experienced a one-year decrease of 2.3% and interruptible sales decreased by 13.7%. On 31 March 1983 there were 337 795 firm customers and 99 interruptible customers on the system. One year earlier there were 327 246 firm customers and 95 interruptible customers. Therefore, firm accounts increased by 3.2% while interruptible accounts increased by 4.2%.

This year is the second time that the sale of Compressed Natural Gas (CNG) for automotive purposes has been included in the sales projections. It is assumed that CNG will be actively promoted and that this fuel will be very competitive with gasoline. The demand for CNG is essentially based on the projections prepared for B. C. Hydro by Canadian Resourcecon Limited in December 1981. The demand in the first six years has been modified.

11.2 Probable Projection

The probable sales projections are shown in TABLES 11-11, 11-12 and 11-13 for the Lower Mainland, Metro and Fraser Valley respectively. The first column on the first page of each table shows actual sales. This is followed by normalized sales in the second column followed by normalized sales for the current year and the next five years. The very last column on this page shows the average annual compound growth rate for the six year period from 1982/83 to 1988/89 relative to normalized sales (Column #2).

The assumptions underlying the probable as well as the high and low projections are listed in detail in Part 11.8. The probable forecast is the main one. System plans and operating budgets are based on it.

11.3 High and Low Projections

The high sales projections for the Lower Mainland are shown in TABLE 11-16, and the low projections in TABLE 11-17.

Neither the high nor the low forecasts are based on extreme sets of assumptions such as unavailability or dumping of natural gas. Both of these projections could be realized when the pace of the economy speeds up or slows down from the conditions assumed for the probable projection.

The high and low projections differ only from the probable one relative to the following classifications: Residential with Heating (RWH), General with Heating (GWH), Compressed Natural Gas (CNG), and Interruptible (INT). However, these classifications represented 95.6% of the total load in fiscal year 1982/83.

11.4 Sales Comparison

Comparisons of actual and normalized gas sales with probable projections prepared at different times for the Lower Mainland area are shown in TABLE 11-14. For each generation of forecasts, total sales volumes are shown for five fiscal year periods. The next two lines for each forecast show the percentages of the variances of forecast relative to actual sales (A) and normalized sales (N). A negative sign indicates that the forecast was too low.

11.5 Vancouver Island

TABLE 11-15 shows the projection of probable LP gas sales on Vancouver Island. The forecast assumes that the load will be increased during the current year and that it will reach the full capacity of the presently installed system. It is also assumed that the load will remain at that level unless the natural gas pipeline crossing to Vancouver Island is completed during the forecast period.

11.6 Composition of Residential Dwellings and Market Shares Captured

Relative housing starts in that part of the Lower Mainland which is served by natural gas (Gas Area) during calender year 1982 were as follows:

	Metro (%)	Fraser Valley (%)	Lower Mainland (%)
Singles & Duplexes	19	37	28
Row Houses	19	25	22
Apartments	62	38	50
	100	100	100

Capture rates of residential space heating in new housing in the Lower Mainland for the same one year period were as shown below:

	Natural Gas (%)	Electric (%)	Other (%)
Singles & Duplexes	90	7	3
Row Houses	19	81	0
Apartments	42	58	0
Weighted Total	51	49	1

GAS
ASSUMPTIONS

11.7 Abbreviations

The abbreviations used in the following assumptions are explained below.

Customer Classifications

RWOH - Residential Service without Space Heating
RWH - Residential Service with Space Heating

GWOH - Non-Residential Service without Space Heating (General)
GWH - Non-Residential Service with Space Heating (General)

SEAS - Industrial or Commercial Service Principally during Off-Peak Period
INT - Interruptible Service for General, Commercial or Industrial Use

Common Abbreviations

BF - Basic Firm (non-interruptible)
UAF - Un-Accounted For Gas (System Losses and Metering Errors)

LPG - Liquid Petroleum Gas (Victoria System)
CNG - Compressed Natural Gas (for Automotive Purposes)

Metro - Metropolitan
FV - Fraser Valley

LM - Lower Mainland
BU - Billing Unit (10^8 Joules)

11.8 General Assumptions Relating to the Three Natural Gas Projections

1. Three sales projections have been prepared for the 21 year period ending 2003/04, low, probable and high.

2. These projections will be extended another 10 years to the year 2013/14 if required for hearings, etc.

3. The probable projection is the most important one. It is the one upon which contract demand nomination, budgets, and timing of system expansion or improvements will be based.

4. The high projection will show loads and revenues greater than for the probable one, while the low projection will show smaller loads and revenues than the latter.

5. Neither the high nor the low projection is based on extreme sets of assumptions such as unavailability or dumping of natural gas. Both these projections can be realized when the pace of the economy speeds up or slows down from the conditions assumed for the probable projection.

6. The residential space heating load additions for electricity and natural gas in the Lower Mainland were closely integrated. This was done taking into consideration such factors as types of dwelling, demolitions, capture rates and conversions from oil.

7. The residential load forecasts are closely related to the three population forecasts shown in B. C. Hydro's Long Term Economic Outlook issued in May 1983.

8. The forecasts for the general load categories are to a large degree determined by the GDP projections shown in the document referred to above under (7).

9. The interruptible load was reduced relative to last year's forecasts. There are a number of reasons for this:

   (a) It is very unlikely that major natural gas using projects will be located in the Lower Mainland area as a result of strong public opposition to such developments because of environmental concerns.

   (b) The strong possibility that the two cement plants, which are the largest customers, will switch at least a substantial part of their load away from natural gas.

   (c) A forecast relative increase of natural gas prices with respect to oil.

   Several major interruptible customers with process heating loads were contacted this spring in order to obtain their views with regard to their expected natural gas consumption requirements for the next few years. These views have been taken into account in preparing the load forecast.

10. This year the sales forecasts include again provision for CNG used for automotive purposes. The CNG forecasts included were the ones prepared by Canadian Resourcecon Limited. However, the following modifications were made:

    (a) In the high forecast we included Resourcecon's probable rather than their high CNG forecast.

    (b) The loads during the first six years were reduced somewhat by Gas Supply Planning. This modification was also incorporated in our CNG forecast.

    In spite of these modifications the CNG probable and high forecasts might probably still be considered to be optimistic for the following reasons:

    (a) Penetration rates for automobiles of 12% by the year 2000 and 20% by 2010 were assumed for the medium forecast, and 25% by 2000 and 50% by 2010 for the high forecast. These penetration rates might be considered to be optimistic.

(b) Fuel costs of $0.423 per litre of gasoline and $0.215 per litre of CNG. This large price difference may narrow over the 31 year forecast period as a result of the introduction of road taxes on CNG.

For details of the CNG forecasts and the breakdown into firm and interruptible components see TABLE 11-8.

11. The three forecasts differ also with respect to rates of conversion from oil to natural gas and energy conservation.

12. The high and low projections differ only from the probable one relative to the following classifications: RWH, GWH, CNG and INT. However, these classifications represented 95.6% of the total load in fiscal year 1982/83. (For explanation of classification codes see Part 11-7)

13. The total load in 1993/94 is anticipated to be $1,219.2 \times 10^6$ BU according to the probable forecast. The high forecast expects a total load of $1,343.6 \times 10^6$ BU, or 10.2% larger while the low forecast shows a value of $1,108.0 \times 10^6$ BU, or 9.1% smaller than the probable forecast.

14. The three forecasts show the following average annual compound growth rates for sales in the Lower Mainland (for further details see TABLE 11-1):

	1982/83 - 1993/94		1993/94 - 2003/04		1982/83 - 2003/04	
	July/83 (%)	Sept/82 (%)	July/83 (%)	Sept/82 (%)	July/83 (%)	Sept/82 (%)
Basic Firm						
- High	4.0	4.4	3.6	3.7	3.8	4.1
- Probable	2.9	3.2	3.0	3.2	3.0	3.2
- Low	1.9	2.1	2.2	2.6	2.1	2.3
Interruptible						
- High	3.0	2.4	1.8	2.1	2.5	2.3
- Probable	2.7	2.1	1.5	1.8	2.1	2.0
- Low	2.3	1.7	1.2	1.5	1.8	1.6
Total						
- High	3.8	4.0	3.3	3.4	3.5	3.7
- Probable	2.9	3.0	2.7	2.9	2.8	3.0
- Low	2.0	2.0	2.0	2.3	2.0	2.2

15. The total average annual use rates for RWH and GWH customers were normalized and then broken down into a non-heating and a (space) heating component. The non-heating component was assumed to develop according to the data shown in TABLE 11-2 while the space heating component is shown in TABLE 11-3.

With respect to use rates the following points are emphasized:

(a) The normalized use rates of the six firm classifications of customers for fiscal year 1982/83 multiplied by their average numbers of account during that period is equal to normalized basic firm send-out less 6.0% unaccounted-for gas (UAF).

(b) An examination of the plots of normalized 12 months moving total (12 MMT) use rates for the various firm classifications will show that there are very considerable fluctuations. The selected value for any individual category may be open to argument. However, whatever combination (of 12 individual values) is selected, the relationship under (a) above must be satisfied. There is no doubt that sound judgement and experience are very important in making this selection. This year the use rates for several major categories had to be reduced far more than is justified on the basis of their plots in order to keep UAF gas constant at 6.0%. It appears that UAF actually came in at less than 6.0% due to the abnormally warm winter (approximately 5.2%).

(c) The breakdown of the total RWH and GWH use rates into non-heat and heat components was again re-evaluated this year. This was done taking into account the regression coefficients with respect to weather and the daily base load.

(d) For the RWH customers in the Lower Mainland a statistical study was made to determine the use rate by type of appliance and for space heating by type of dwelling and by area. This was possible by relating the 1981 Appliance Survey made by B. C. Hydro to the loads of the individual respondents. The values provided by this study also correlate well with the results from the analysis discussed under (c) above.

(e) The effect was determined on the space heating component of the RWH category by the envisioned change in housing mix.

(f) Energy Services re-evaluated the savings resulting from conservation measures for the RWH and GWH categories.

(g) Starting from a breakdown of the space heating losses of a typical 1,200 Square Foot (SF) house, which was provided by Energy Services, another assessment was made of the potential reasonable savings that could be made for retrofitting and for new dwellings built according to more severe insulation standards and equipped with more efficient appliances. The

results of this study are reflected in the values shown in TABLE 11-3. These figures also indicate that the heating component of the average annual use rate is higher in Metro than in the Fraser Valley. This is due to the fact that the average house in the former is older and poorer insulated than in the latter. That is also the reason that retrofitting will have a larger relative impact in Metro than in the Fraser Valley. Since the average house in Metro is smaller than in the Fraser Valley, the heating component of a house after retrofitting and of a house built under the new building code will be smaller than for a similar dwelling in the Fraser Valley.

16. The following annual number of retrofits have been assumed starting in the fiscal year 1983/84:

	RWH			GWH		
	Metro	F.V.	L.M.	Metro	F.V.	L.M.
High	8 000	5 000	13 000	800	200	1 000
Probable	10 000	6 000	16 000	1 000	250	1 250
Low	12 000	8 000	20 000	1 200	300	1 500
Initial Stock at 3/83	88 000	45 500	133 500	12 800	4 750	17 550
Retrofits prior to 3/83	54 000	35 000	89 000	6 350	1 880	8 230

17. Details of the assumptions made with respect to conversion of houses and apartments from oil to natural gas are shown in TABLES 11-4 and 11-5 respectively. The initial stock available at March 1983 was obtained from the May 1983 update of the annual study "Residential Housing Stock by Type of Space Heating". There was a significant reduction in the available stock of potential conversions from oil as a result of the recent statistical analysis that was made of the premise codes of B. C. Hydro's billing system. Changes in premise code resulted in many cases in a reclassification of the heating classification of those dwellings.

18. The accounts added to the RWH and GWH categories over the forecast period are shown in TABLE 11-6.

19. TABLE 11-7 shows anticipated net interruptible sales other than CNG for the three forecasts. All sales shown are net of 30 days of curtailment. The volumes shown for 1982/83 are also normalized and net of strikes. Interruptible customers with I/F cost ratios > 0.95 were not switched to firm.

20. TABLE G2 in the Summary of Projections of the Gas Load Requirements shows that the normalized interruptible load in fiscal years 1981/82 and 1973/74 are essentially the same. This fact, together with the three reasons mentioned in point (9) above, were major factors in the further reduction that was made this year in the interruptible load projections.

21. TABLE 11-9 shows a breakdown of the interruptible load for fiscal year 1982/83 by classification.

22. This year a considerable amount of effort was again made to reconcile residential electric and natural gas accounts. For electricity there are two types of accounts, with and without space heating. For natural gas the RWH category represents accounts with space heating. The reconciliation took into account new construction, demolitions and conversions by type of dwelling. Another factor taken into account is the fact that part of the Lower Mainland is not served with natural gas. TABLE 11-10 shows the comparison of residential electric and natural gas heating accounts in the gas area as included in current projections.

COMPARISON OF LOAD PROJECTIONS PROBABLE VS HIGH VS LOW July/83 vs Sept/82

TABLE 11-1

TOTAL SALES VOLUMES (10^3 BU)		1982/83 (Normalized)	1988/89	1993/94	2003/04
July/83 Forecasts					
BF	- High		904 170	1 086 040	1 544 750
	- Probable	706 350	846 970	970 440	1 302 850
	- Low		793 410	869 660	1 083 260
INT	- High		232 970	257 610	308 670
	- Probable	185 630	228 170	248 710	289 570
	- Low		221 960	238 330	268 550
Total	- High		1 137 140	1 343 650	1 853 420
	- Probable	891 980	1 075 140	1 219 150	1 592 420
	- Low		1 015 370	1 107 990	1 351 810
Sept/82 Forecasts					
BF	- High		966 770	1 175 460	1 695 130
	- Probable	706 350	899 670	1 036 560	1 423 730
	- Low		832 710	916 380	1 179 940
INT	- High		249 770	279 610	343 370
	- Probable	185 630	245 470	271 010	323 470
	- Low		239 660	259 530	299 950
Total	- High		1 216 540	1 455 070	2 038 500
	- Probable	891 980	1 145 140	1 307 570	1 747 200
	- Low		1 072 370	1 175 910	1 479 890

AV. ANN. GROWTH (%) (Sept/82 Values Bracketed)		82/83-88/89	88/89-93/94	82/83-93/94	93/94-03/04	82/83-03/04
BF	- High	4.2 (4.7)	3.7 (4.0)	4.0 (4.4)	3.6 (3.7)	3.8 (4.1)
	- Probable	3.1 (3.5)	2.8 (2.9)	2.9 (3.2)	3.0 (3.2)	3.0 (3.2)
	- Low	2.0 (2.3)	1.9 (1.9)	1.9 (2.1)	2.2 (2.6)	2.1 (2.3)
INT	- High	3.9 (2.5)	2.0 (2.3)	3.0 (2.4)	1.8 (2.1)	2.5 (2.3)
	- Probable	3.2 (2.2)	1.7 (2.0)	2.7 (2.1)	1.5 (1.8)	2.1 (2.0)
	- Low	2.2 (1.8)	1.4 (1.6)	2.3 (1.7)	1.2 (1.5)	1.8 (1.6)
Total	- High	4.1 (4.2)	3.4 (3.6)	3.8 (4.0)	3.3 (3.4)	3.5 (3.7)
	- Probable	3.2 (3.2)	2.6 (2.7)	2.9 (3.0)	2.7 (2.9)	2.8 (3.0)
	- Low	2.2 (2.2)	1.8 (1.9)	2.0 (2.0)	2.0 (2.3)	2.0 (2.2)

NON-HEATING COMPONENT OF RESIDENTIAL AND GENERAL AVERAGE ANNUAL USE RATES (GJ/Customer/Year)

TABLE 11-2

	No. of Years	METROPOLITAN High	METROPOLITAN Prob.	METROPOLITAN Low	FRASER VALLEY High	FRASER VALLEY Prob.	FRASER VALLEY Low
Residential With Heat (RWH)							
Base for 1982/83	-	290	290	290	265	265	265
1983/84 to 1985/86	3	+6/Y	+3/Y	0/Y	+6/Y	+3/Y	0/Y
1986/87 to 1988/89	3	+5/Y	+2/Y	-1/Y	+5/Y	+2/Y	-1/Y
1989/90 to 1993/94	5	+3/Y	+1/Y	-1/Y	+3/Y	+1/Y	-1/Y
1994/95 to 1998/99	5	+2/Y	0/Y	-2/Y	+2/Y	0/Y	-2/Y
1999/00 to 2003/04	5	+1/Y	0/Y	-1/Y	+1/Y	0/Y	-1/Y
General With Heat (GWH)							
Base for 1982/83	-	2 050	2 050	2 050	1 400	1 400	1 400
1983/84 1985/86	3	+25/Y	+25/Y	+25/Y	+125/Y	+100/Y	+100/Y
1986/87 1988/89	3	+25/Y	+20/Y	+10/Y	+125/Y	+75/Y	+50/Y
1989/90 1993/94	5	+20/Y	+15/Y	+5/Y	+100/Y	+50/Y	+30/Y
1994/95 1998/99	5	+15/Y	+10/Y	0/Y	+75/Y	+35/Y	+10/Y
1999/00 2003/04	5	+10/Y	+5/Y	0/Y	+50/Y	+25/Y	+5/Y

SPACE HEATING COMPONENT OF RESIDENTIAL AND GENERAL AVERAGE ANNUAL USE RATES
(BU/Customer/Year)

TABLE 11-3

	Existing Premises	RETROFIT Prior to 1985/86	RETROFIT From 1985/86	NEW PREMISES Prior to 1984/85	NEW PREMISES From 1984/86
Residential With Heat (RWH)					
Metro					
Savings (%)					
- High	-	15	15	45	45
- Probable	-	15	20	50	55
- Low	-	20	25	55	60
Load (BU)					
- High	1 040	884	884	572	572
- Probable	1 040	884	832	520	468
- Low	1 040	832	780	468	416
Fraser Valley					
Savings (%)					
- High	-	10	10	40	40
- Probable	-	10	15	45	50
- Low	-	15	20	50	55
Load (BU)					
- High	925	832	832	555	555
- Probable	925	832	786	509	462
- Low	925	786	740	462	416
General With Heat (GWH)					
Metro					
Savings (%)					
- High	-	2	5	10	15
- Probable	-	6	12	19	28
- Low	-	11	20	30	41
Load (BU)					
- High	8 300	8 130	7 880	7 470	7 060
- Probable	8 300	7 800	7 300	6 720	5 980
- Low	8 300	7 390	6 640	5 810	4 900
Fraser Valley					
Savings (%)					
- High	-	2	5	10	15
- Probable	-	6	12	19	28
- Low	-	11	20	30	41
Load (BU)					
- High	5 800	5 680	5 510	5 220	4 930
- Probable	5 800	5 450	5 100	4 700	4 180
- Low	5 800	5 160	4 640	4 060	3 420

CONVERSIONS OF HOUSES FROM OIL TO NATURAL GAS (Affecting RWH Category)

TABLE 11-4

Fiscal Year	HIGH			PROBABLE			LOW		
	Metro	FV	LM	Metro	FV	LM	Metro	FV	LM
Initial Stock									
@ 3/83	20 417	19 708	40 125	20 417	19 708	40 125	20 417	19 708	40 125
1983/84	4 500	1 700	6 200	4 000	1 500	5 500	3 500	1 300	4 800
1984/85	4 100	1 500	5 600	3 500	1 250	4 750	3 200	1 100	4 300
1985/86	3 500	1 500	5 000	3 000	1 250	4 250	2 700	1 100	3 800
1986/87	1 000	1 200	2 200	2 000	1 000	3 000	1 800	1 000	2 800
1987/88	600	1 000	1 600	1 000	1 000	2 000	1 000	1 000	2 000
1988/89	310	600	910	500	1 000	1 500	1 000	800	1 800
1989/90	-	-	-	10	500	510	500	500	1 000
1990/91	-	-	-	-	-	-	310	500	810
1991/92	-	-	-	-	-	-	-	200	200
1992/93	-	-	-	-	-	-	-	-	-
1993/94	-	-	-	-	-	-	-	-	-
1994/95	-	-	-	-	-	-	-	-	-
1995/96	-	-	-	-	-	-	-	-	-
1996/97	-	-	-	-	-	-	-	-	-
1997/98	-	-	-	-	-	-	-	-	-
1998/99									
1999/00	-	-	-	-	-	-	-	-	-
2000/01	-	-	-	-	-	-	-	-	-
2001/02	-	-	-	-	-	-	-	-	-
2002/03	-	-	-	-	-	-	-	-	-
2003/04	-	-	-	-	-	-	-	-	-
TOTAL	14 010	7 500	21 510	14 010	7 500	21 510	14 010	7 500	21 510

NOTE: Difference between total conversions and initial stock is due to the following reasons:

(a) demolitions (Metro and FV);
(b) customers who do not want to convert (Metro and FV);
(c) high cost of conversion due to remoteness of dwelling relative to the road (FV).

CONVERSIONS OF APARTMENTS FROM OIL TO NATURAL GAS
(Affecting GWH Category)

TABLE 11-5

Fiscal Year	HIGH Metro	HIGH FV	HIGH LM	PROBABLE Metro	PROBABLE FV	PROBABLE LM	LOW Metro	LOW FV	LOW LM
Initial Stock									
@ 3/83	3 246	647	3 893	3 246	647	3 893	3 246	647	3 893
1983/84	1 020	40	1 060	1 000	30	1 030	1 000	25	1 025
1984/85	730	40	770	700	30	730	650	25	675
1985/86	350	30	380	400	30	430	350	25	375
1986/87	-	30	30	-	30	30	100	25	125
1987/88	-	30	30	-	30	30	-	20	20
1988/89	-	10	10	-	20	20	-	20	20
1989/90	-	-	-	-	10	10	-	20	20
1990/91	-	-	-	-	-	-	-	20	20
1991/92	-	-	-	-	-	-	-	-	-
1992/93	-	-	-	-	-	-	-	-	-
1993/94	-	-	-	-	-	-	-	-	-
1994/95	-	-	-	-	-	-	-	-	-
1995/96	-	-	-	-	-	-	-	-	-
1996/97	-	-	-	-	-	-	-	-	-
1997/98	-	-	-	-	-	-	-	-	-
1998/99	-	-	-	-	-	-	-	-	-
1999/00	-	-	-	-	-	-	-	-	-
2000/01	-	-	-	-	-	-	-	-	-
2001/02	-	-	-	-	-	-	-	-	-
2002/03	-	-	-	-	-	-	-	-	-
2003/04	-	-	-	-	-	-	-	-	-
TOTAL	2 100	180	2 280	2 100	180	2 280	2 100	180	2 280

RESIDENTIAL AND GENERAL ACCOUNTS WITH SPACE HEATING ADDED TO THE NATURAL GAS SYSTEM

TABLE 11-6

Cat	Period From	Period To	Δ (Yrs)	METROPOLITAN High Δ	METROPOLITAN High Y/E	METROPOLITAN Prob Δ	METROPOLITAN Prob Y/E	METROPOLITAN Low Δ	METROPOLITAN Low Y/E	FRASER VALLEY High Δ	FRASER VALLEY High Y/E	FRASER VALLEY Prob Δ	FRASER VALLEY Prob Y/E	FRASER VALLEY Low Δ	FRASER VALLEY Low Y/E
RWH	Base @ 3/83		-		181 432		181 432		181 432		110 378		110 378		110 378
RWH	1983/84	1988/89	6	32 268	213 700	30 868	212 300	28 968	210 400	32 722	143 100	30 022	140 400	26 222	136 600
RWH	1989/90	1993/94	5	16 700	230 400	15 200	227 500	14 300	224 700	24 700	167 800	23 200	163 600	21 400	158 000
RWH	1994/95	1998/99	5	17 400	247 800	15 900	243 400	13 400	238 100	27 400	195 200	25 400	189 000	22 900	180 900
RWH	1999/00	2003/04	5	18 800	266 600	17 300	260 700	14 800	252 900	30 000	225 200	28 000	217 000	25 000	205 900
				85 168		79 268		71 468		114 822		106 622		95 522	
GWH	Base @ 3/83		-		23,044		23,044		23,044		10,181		10,181		10,181
GWH	1983/84	1988/89	6	6 456	29,500	4 456	27 500	3 956	27 000	5 019	15 200	4 419	14 600	3 919	14 100
GWH	1989/90	1993/94	5	7 900	37 400	5 900	33 400	5 400	32 400	6 900	22 100	5 900	20 500	5 400	19 500
GWH	1994/95	1998/99	5	9 100	46 500	7 100	40 500	6 600	39 000	8 000	30 100	7 000	27 500	6 500	26 000
GWH	1999/00	2003/04	5	10 200	56 700	8 200	48 700	7 700	46 700	8 700	38 800	7 700	35 200	7 200	33 200
				33 656		25 656		23 656		28 619		25 019		23 019	

NET INTERRUPTIBLE SALES OTHER THAN CNG
(@ 30 Days Curtailment)

TABLE 11-7

Period From	Period To	Δ (Yrs)	METRO Y/E Acc.	METRO Sales (10^3 BU)	FRASER VALLEY Y/E Acc.	FRASER VALLEY Sales (10^3 BU)	LOWER MAINLAND Y/E Acc.	LOWER MAINLAND Sales (10^3 BU)
Base @ 3/83			80	157 310	19	28 200	99	185 510
PROBABLE FORECAST								
1983/84	1988/89	6	85	191 600	22	33 000	107	224 600
1989/90	1993/94	5	92	207 400	24	35 900	116	243 300
1994/95	1998/99	5	99	223 400	26	38 900	125	262 300
1999/00	2003/04	5	106	239 500	28	41 900	134	281 400
HIGH FORECAST								
1983/84	1988/89	6	85	195 700	22	33 700	107	229 400
1989/90	1993/94	5	93	215 000	25	37 200	118	252 200
1994/95	1998/99	5	102	235 100	27	40 900	129	276 000
1999/00	2003/04	5	111	255 800	30	44 700	141	300 500
LOW FORECAST								
1983/84	1988/89	6	85	187 500	22	32 500	107	220 000
1989/90	1993/94	5	91	201 000	23	34 800	114	235 800
1994/95	1998/99	5	97	213 400	25	37 100	122	250 500
1999/00	2003/04	5	102	225 400	26	39 400	128	264 800

TABLE 11-8

B. C. HYDRO
PROJECTIONS OF COMPRESSED NATURAL GAS
LOWER MAINLAND
(included in Low, Probable and High Total Projections)
(Thousand BU)[a]

Fiscal Year	LOW PROJECTION			PROBABLE PROJECTION			HIGH PROJECTION		
	Firm	Interruptible	Total	Firm	Interruptible	Total	Firm	Interruptible	Total
1982/83	169	120	289	169	120	289	169	120	289
1983/84	230	190	420	310	280	590	310	280	590
1984/85	500	300	800	750	500	1 250	750	500	1 250
1985/86	1 090	600	1 690	3 670	1 200	4 870	3 670	1 200	4 870
1986/87	2 630	1 000	3 630	8 760	2 100	10 860	8 760	2 100	10 860
1987/88	4 640	1 660	6 300	15 460	3 010	18 470	15 460	3 010	18 470
1988/89	6 760	1 960	8 720	22 520	3 570	26 090	22 520	3 570	26 090
1989/90	8 690	2 110	10 800	27 590	3 860	31 450	27 590	3 860	31 450
1990/91	9 680	2 220	11 900	33 530	4 890	38 420	33 530	4 890	38 420
1991/92	9 920	2 310	12 230	36 220	5 040	41 260	36 220	5 040	41 260
1992/93	10 160	2 410	12 570	39 080	5 220	44 300	39 080	5 220	44 300
1993/94	10 390	2 530	12 920	42 170	5 410	47 580	42 170	5 410	47 580
1994/95	10 640	2 640	13 280	45 500	5 600	51 100	45 500	5 600	51 100
1995/96	10 880	2 780	13 660	49 060	5 810	54 870	49 060	5 810	54 870
1996/97	11 150	2 890	14 040	52 890	6 040	58 930	52 890	6 040	58 930
1997/98	11 400	3 030	14 430	57 000	6 290	63 290	57 000	6 290	63 290
1998/99	11 670	3 160	14 830	61 390	6 570	67 960	61 390	6 570	67 960
1999/00	11 940	3 310	15 250	66 130	6 860	72 990	66 130	6 860	72 990
2000/01	12 210	3 460	15 670	71 220	7 160	78 380	71 220	7 160	78 380
2001/02	12 430	3 560	15 990	75 530	7 490	83 020	75 530	7 490	83 020
2002/03	12 640	3 660	16 300	80 120	7 810	87 930	80 120	7 810	87 930
2003/04	12 880	3 750	16 630	84 970	8 170	93 140	84 970	8 170	93 140

NOTE:

[a] BU = Billing Unit = 10^8 Joules

11 July 1983

TABLE 11-9

INTERRUPTIBLE LOAD BY CLASSIFICATION
Fiscal Year 1982/83

No.	Classification	Actual Volume ($10^3 m^3$)	(10^3BU)	(%)
13	Hospitals	39,025	15,298	7.7
10	Universities, Institutions, Government	44,946	17,619	8.8
5	Hotels, Office Buildings, Apartment Buildings	31,536	12,362	6.2
28	Subtotal	115,507	45,279	22.7
13	Concrete, Cement, Construction Materials	82,475	32,330	16.2
4	Oil Refineries	97,011	38,028	19.1
14	Forest Products	81,419	31,916	16.0
6	Chemicals	58,334	22,867	11.4
17	Food Processing, Breweries, Distilleries	45,918	18,000	9.0
5	Metal Industries	11,323	4,439	2.2
11	Small Industries, Miscellaneous	17,094	6,701	3.4
70	Subtotal	393,574	154,281	77.3
98	Total	509,081	199,560	100.0

NOTES:

1. The actual volume purchased by an interruptible customer is affected by weather, strikes and curtailment.
2. The average annual heat rate for fiscal year 1982/83 was 39.20 MJ/m^3.
3. 1 BU = 10^8 Joules.

RELATIONSHIP BETWEEN NET RESIDENTIAL ELECTRIC AND NATURAL GAS ACCOUNTS[a]
Lower Mainland

TABLE 11-10

NET RES. ELECTRIC ACCOUNT ADDITIONS	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
Metro (Gas Area)											
Non-Heat	2,489	3,140	3,609	3,738	3,737	3,881	3,952	3,989	3,957	3,973	4,032
Heat	2,031	2,417	2,683	2,707	2,642	2,660	2,641	2,594	2,466	2,418	2,374
Total	4,520	5,557	6,292	6,445	6,379	6,541	6,593	6,583	6,423	6,391	6,406
FV (Gas Area)											
Non-Heat	3,312	4,018	4,570	4,763	4,787	4,970	5,120	5,195	5,176	5,300	5,399
Heat	2,044	2,391	2,632	2,690	2,669	2,727	2,736	2,723	2,660	2,638	2,627
Total	5,356	6,409	7,202	7,453	7,456	7,697	7,856	7,918	7,836	7,938	8,026
LM (Gas Area)											
Non-Heat	5,801	7,158	8,179	8,501	8,524	8,851	9,072	9,184	9,133	9,273	9,431
Heat	4,075	4,808	5,315	5,397	5,311	5,387	5,377	5,317	5,126	5,056	5,001
Total	9,876	11,966	13,494	13,898	13,835	14,238	14,449	14,501	14,259	14,329	14,432
LM (No Gas Area)											
Non-Heat	110	110	120	120	130	130	130	130	140	140	140
Heat	650	650	660	660	660	670	670	670	680	680	680
Total	760	760	780	780	790	800	800	800	820	820	820
LM (Electric Area)[b]											
Non-Heat	5,911	7,268	8,299	8,621	8,654	8,981	9,202	9,314	9,273	9,413	9,571
Heat	4,725	5,458	5,975	6,057	5,971	6,057	6,047	5,987	5,806	5,736	5,681
Total	10,636	12,726	14,274	14,678	14,625	15,038	15,249	15,301	15,079	15,149	15,252
NET NATURAL GAS RES. WITH HTG (RWH)											
Metro	6,153	6,074	5,892	4,991	4,028	3,664	3,254	3,106	2,947	2,888	2,913
FV	4,448	4,749	5,188	5,107	5,128	5,278	4,910	4,475	4,459	4,564	4,657
LM Total	10,601	10,823	11,080	10,098	9,156	8,942	8,164	7,581	7,406	7,452	7,570

Notes: [a] All account additions refer to fiscal year end accounts.
[b] Differences in fiscal year end total residential electric accounts for the Lower Mainland (electric area) between this table and Table AG1: Probable Projection of Electric Power Sales - Lower Mainland are the result of rounding.

MST157

11 July 1983

GAS
PROBABLE PROJECTION

TABLE 11-11

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 1 OF 4

1983 EDITION REVISION# 0 LOWER MAINLAND

	FISCAL 1982/83 ACTUAL	FISCAL 1982/83 NORMAL	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	GROWTH RATE (%)
RES WITHOUT HEAT									
YEAR END ACCTS	9,634	9,634	9,700	9,350	9,000	8,650	8,300	7,950	-3.15
AVG ANNUAL ACCTS	9,888	9,888	9,668	9,525	9,175	8,825	8,475	8,125	
AVG ANNUAL USE(BU)	699	704	719	732	744	756	767	778	1.68
SALES (1000 BU)	6,856	6,900	6,950	6,970	6,830	6,670	6,500	6,320	-1.45
RES WITH HEAT									
YEAR END ACCTS	291,810	291,810	302,500	313,400	324,500	334,600	343,700	352,700	3.21
AVG ANNUAL ACCTS	286,639	286,639	297,150	307,950	318,950	329,550	339,150	348,200	
AVG ANNUAL USE(BU)	1,208	1,264	1,273	1,266	1,244	1,224	1,206	1,189	-1.01
SALES (1000 BU)	346,163	362,320	378,300	390,000	396,900	403,400	409,000	414,100	2.25
GEN WITHOUT HEAT									
YEAR END ACCTS	3,001	3,001	2,785	2,593	2,401	2,259	2,117	2,025	-6.35
AVG ANNUAL ACCTS	3,114	3,114	2,895	2,690	2,495	2,330	2,190	2,070	
AVG ANNUAL USE(BU)	9,710	9,210	10,125	11,248	12,155	12,910	13,505	13,935	7.15
SALES (1000 BU)	30,234	28,680	29,310	30,240	30,330	30,080	29,580	28,850	0.10
GEN WITH HEAT									
YEAR END ACCTS	33,225	33,225	34,300	35,300	36,500	38,100	40,100	42,100	4.02
AVG ANNUAL ACCTS	32,747	32,747	33,760	34,800	35,900	37,300	39,100	41,100	
AVG ANNUAL USE(BU)	9,140	9,360	9,410	9,410	9,340	9,258	9,170	9,080	-0.50
SALES (1000 BU)	299,304	306,440	317,600	327,300	335,300	345,000	358,600	373,200	3.34
SEASONAL									
YEAR END ACCTS	43	43	44	45	46	46	48	48	1.85
AVG ANNUAL ACCTS	42	42	44	45	46	46	48	48	
AVG ANNUAL USE(BU)	23,020	21,900	20,450	19,560	19,130	19,350	19,580	20,000	-1.50
SALES (1000 BU)	967	920	900	880	880	890	940	960	0.71
BC HYDRO USE									
YEAR END ACCTS	79	79	79	81	81	82	83	84	1.03
AVG ANNUAL ACCTS	79	79	80	81	81	82	83	84	
AVG ANNUAL USE(BU)	10,800	11,650	11,750	11,850	11,850	12,070	12,050	12,140	0.69
SALES (1000 BU)	853	920	940	960	960	990	1,000	1,020	1.73
CNG(FIRM)									
YEAR END ACCTS	3	3	5	14	29	40	49	57	63.35
AVG ANNUAL ACCTS	1	2	4	10	22	35	45	53	
AVG ANNUAL USE(BU)	260,000	85,000	87,500	93,000	166,800	250,300	343,600	424,900	30.76
SALES (1000 BU)	260	170	350	930	3,670	8,760	15,460	22,520	125.78
TOTAL FIRM									
YEAR END ACCTS	337,795	337,795	349,413	360,783	372,557	383,777	394,397	404,964	3.07
AVG ANNUAL ACCTS	332,430	332,431	343,598	355,101	366,669	378,168	389,091	399,680	
AVG ANNUAL USE(BU)	2,059	2,125	2,137	2,133	2,113	2,104	2,110	2,119	-0.05
SALES (1000 BU)	684,637	706,350	734,350	757,280	774,870	795,790	821,080	846,970	3.07
CNG(INTERRUP.)									
YEAR END ACCTS		1	1	3	4	4	4	6	34.80
AVG ANNUAL ACCTS		1	1	3	4	4	4	6	
AVG ANNUAL USE(BU)		120,000	950,000	643,300	642,500	677,500	752,500	595,000	30.58
SALES (1000 BU)		120	950	1,930	2,570	2,710	3,010	3,570	76.03
OTHER INTERRUP.									
YEAR END ACCTS	99	99	106	106	106	106	107	107	1.30
AVG ANNUAL ACCTS	97	97	103	106	106	106	107	107	
AVG ANNUAL USE(BU)	2,057,300	1,912,500	1,803,900	1,867,000	1,963,200	2,014,200	2,045,800	2,099,100	1.56
SALES (1000 BU)	199,557	185,510	185,800	197,900	208,100	213,500	218,900	224,600	3.24
TOTAL INTERRUPT.									
YEAR END ACCTS	99	100	107	109	110	110	111	113	2.06
AVG ANNUAL ACCTS	97	98	104	109	110	110	111	113	
AVG ANNUAL USE(BU)	2,057,300	1,894,200	1,795,700	1,833,300	1,915,200	1,965,500	1,999,200	2,019,200	1.07
SALES (1000 BU)	199,557	185,630	186,750	199,830	210,670	216,210	221,910	228,170	3.50
TOTAL SALES									
YEAR END ACCTS	337,894	337,895	349,520	360,892	372,667	383,887	394,508	405,077	3.07
AVG ANNUAL ACCTS	332,527	332,529	343,702	355,210	366,779	378,278	389,202	399,793	
AVG ANNUAL USE(BU)	2,659	2,682	2,680	2,694	2,687	2,675	2,680	2,689	0.04
SALES (1000 BU)	884,194	891,980	921,100	957,110	985,540	1,012,000	1,042,990	1,075,140	3.16

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/T RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-11

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 2 OF 4

1983 EDITION REVISION# 0 LOWER MAINLAND

	1989/90	1990/91	1991/92	1992/93	1993/94	AVG. ANNUAL GROWTH 5 YRS(%)	11 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	7,700	7,450	7,200	6,950	6,700	-3.36	-3.25
AVG ANNUAL ACCTS	7,825	7,575	7,325	7,075	6,825		
AVG ANNUAL USE(BU)	785	791	797	804	810	0.81	1.28
SALES (1000 BU)	6,140	5,990	5,840	5,690	5,530	-2.64	-1.99
RES WITH HEAT							
YEAR END ACCTS	360,900	368,500	376,000	383,500	391,100	2.09	2.70
AVG ANNUAL ACCTS	356,800	364,700	372,250	379,750	387,300		
AVG ANNUAL USE(BU)	1,173	1,158	1,145	1,138	1,133	-0.96	-0.99
SALES (1000 BU)	418,400	422,300	426,200	432,300	438,700	1.16	1.75
GEN WITHOUT HEAT							
YEAR END ACCTS	1,930	1,835	1,740	1,645	1,550	-5.21	-5.83
AVG ANNUAL ACCTS	1,980	1,885	1,790	1,695	1,600		
AVG ANNUAL USE(BU)	14,340	14,730	15,135	15,585	16,095	2.92	5.21
SALES (1000 BU)	28,390	27,770	27,090	26,420	25,750	-2.25	-0.97
GEN WITH HEAT							
YEAR END ACCTS	44,300	46,500	48,900	51,300	53,900	5.07	4.50
AVG ANNUAL ACCTS	43,200	45,400	47,700	50,100	52,600		
AVG ANNUAL USE(BU)	8,980	8,890	8,810	8,740	8,670	-0.92	-0.69
SALES (1000 BU)	387,980	403,800	420,300	437,900	456,100	4.89	3.68
SEASONAL							
YEAR END ACCTS	49	50	51	51	53	2.80	1.92
AVG ANNUAL ACCTS	49	50	51	51	53		
AVG ANNUAL USE(BU)	20,200	20,200	20,590	20,590	20,940	0.92	-0.41
SALES (1000 BU)	990	1,010	1,050	1,050	1,110	2.95	1.72
BC HYDRO USE							
YEAR END ACCTS	84	86	86	87	88	0.93	0.99
AVG ANNUAL ACCTS	84	86	86	87	88		
AVG ANNUAL USE(BU)	12,020	12,090	12,210	12,180	12,270	0.21	0.47
SALES (1000 BU)	1,010	1,040	1,050	1,060	1,080	1.15	1.47
CNG(FIRM)							
YEAR END ACCTS	67	78	87	99	109	13.84	38.63
AVG ANNUAL ACCTS	62	73	83	93	104		
AVG ANNUAL USE(BU)	445,000	459,300	436,400	420,200	405,500	-0.93	15.26
SALES (1000 BU)	27,590	33,530	36,220	39,080	42,170	13.37	65.08
TOTAL FIRM							
YEAR END ACCTS	415,030	424,499	434,064	443,632	453,500	2.29	2.71
AVG ANNUAL ACCTS	410,000	419,769	429,285	438,851	448,570		
AVG ANNUAL USE(BU)	2,123	2,133	2,138	2,150	2,163	0.41	0.16
SALES (1000 BU)	870,420	895,440	917,750	943,500	970,440	2.76	2.93
CNG(INTERRUP.)							
YEAR END ACCTS	6	7	8	8	9	8.45	22.11
AVG ANNUAL ACCTS	6	7	8	8	9		
AVG ANNUAL USE(BU)	643,300	698,600	630,000	652,500	601,100	0.20	15.78
SALES (1000 BU)	3,860	4,890	5,040	5,220	5,410	8.67	41.37
OTHER INTERRUP.							
YEAR END ACCTS	108	111	112	115	116	1.63	1.45
AVG ANNUAL ACCTS	108	110	112	114	116		
AVG ANNUAL USE(BU)	2,113,900	2,108,200	2,103,600	2,100,900	2,097,400	-0.02	0.84
SALES (1000 BU)	228,300	231,900	235,600	239,500	243,300	1.61	2.50
TOTAL INTERRUPT.							
YEAR END ACCTS	114	118	120	123	125	2.04	2.05
AVG ANNUAL ACCTS	114	117	120	122	125		
AVG ANNUAL USE(BU)	2,036,500	2,023,800	2,005,300	2,005,900	1,989,700	-0.29	0.45
SALES (1000 BU)	232,160	236,790	240,640	244,720	248,710	1.74	2.70
TOTAL SALES							
YEAR END ACCTS	415,144	424,617	434,184	443,755	453,625	2.29	2.71
AVG ANNUAL ACCTS	410,114	419,886	429,485	438,973	448,695		
AVG ANNUAL USE(BU)	2,688	2,697	2,698	2,707	2,717	0.21	0.12
SALES (1000 BU)	1,102,580	1,132,230	1,158,390	1,188,220	1,219,150	2.55	2.88

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-11

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 3 OF 4

1983 EDITION REVISION# 0 LOWER MAINLAND

	1994/95	1995/96	1996/97	1997/98	1998/99	AVG. ANNUAL GROWTH 5 YRS(%)	16 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	6,500	6,300	6,100	5,900	5,700	-3.18	-3.23
AVG ANNUAL ACCTS	6,600	6,400	6,200	6,000	5,800		
AVG ANNUAL USE(BU)	814	819	824	830	833	0.56	1.06
SALES (1000 BU)	5,370	5,240	5,110	4,980	4,830	-2.67	-2.20
RES WITH HEAT							
YEAR END ACCTS	398,900	407,100	415,400	423,800	432,400	2.03	2.49
AVG ANNUAL ACCTS	395,000	403,000	411,250	419,600	428,100		
AVG ANNUAL USE(BU)	1,125	1,119	1,111	1,105	1,098	-0.63	-0.88
SALES (1000 BU)	444,500	450,800	457,000	463,600	470,100	1.39	1.64
GEN WITHOUT HEAT							
YEAR END ACCTS	1,505	1,460	1,415	1,370	1,325	-3.09	-4.98
AVG ANNUAL ACCTS	1,530	1,485	1,440	1,395	1,350		
AVG ANNUAL USE(BU)	16,510	16,850	17,195	17,570	17,970	2.23	4.27
SALES (1000 BU)	25,260	25,020	24,760	24,510	24,260	-1.19	-1.04
GEN WITH HEAT							
YEAR END ACCTS	56,500	59,300	62,100	65,000	68,000	4.76	4.58
AVG ANNUAL ACCTS	55,200	57,900	60,700	63,550	66,500		
AVG ANNUAL USE(BU)	8,610	8,540	8,500	8,460	8,430	-0.56	-0.65
SALES (1000 BU)	475,000	494,600	515,800	537,800	560,700	4.22	3.85
SEASONAL							
YEAR END ACCTS	53	54	55	56	56	1.11	1.66
AVG ANNUAL ACCTS	53	54	55	56	56		
AVG ANNUAL USE(BU)	20,940	21,300	21,270	21,430	21,610	0.63	-0.08
SALES (1000 BU)	1,110	1,150	1,170	1,200	1,210	1.74	1.73
BC HYDRO USE							
YEAR END ACCTS	89	89	91	91	92	0.89	0.96
AVG ANNUAL ACCTS	89	89	91	91	92		
AVG ANNUAL USE(BU)	12,360	12,250	12,310	12,310	12,390	0.19	0.39
SALES (1000 BU)	1,100	1,090	1,120	1,120	1,140	1.09	1.35
CNG(FIRM)							
YEAR END ACCTS	119	130	141	151	160	7.98	28.21
AVG ANNUAL ACCTS	114	125	136	146	156		
AVG ANNUAL USE(BU)	399,100	392,500	388,900	390,400	393,500	-0.60	10.05
SALES (1000 BU)	45,500	49,060	52,890	57,000	61,390	7.80	44.50
TOTAL FIRM							
YEAR END ACCTS	463,666	474,433	485,302	496,368	507,733	2.28	2.58
AVG ANNUAL ACCTS	458,586	469,053	479,872	490,838	502,054		
AVG ANNUAL USE(BU)	2,176	2,189	2,204	2,221	2,238	0.68	0.32
SALES (1000 BU)	997,840	1,026,960	1,057,850	1,090,210	1,123,630	2.97	2.94
CNG(INTERRUP.)							
YEAR END ACCTS	9	9	9	9	10	2.13	15.48
AVG ANNUAL ACCTS	9	9	9	9	10		
AVG ANNUAL USE(BU)	622,200	645,600	671,100	698,900	657,000	1.79	11.21
SALES (1000 BU)	5,600	5,810	6,040	6,290	6,570	3.96	28.42
OTHER INTERRUP.							
YEAR END ACCTS	117	120	121	124	125	1.51	1.47
AVG ANNUAL ACCTS	117	119	121	123	125		
AVG ANNUAL USE(BU)	2,111,100	2,107,600	2,104,100	2,100,800	2,098,400	0.01	0.58
SALES (1000 BU)	247,000	250,800	254,600	258,400	262,300	1.52	2.19
TOTAL INTERRUPT.							
YEAR END ACCTS	126	129	130	133	135	1.55	1.89
AVG ANNUAL ACCTS	126	128	130	132	135		
AVG ANNUAL USE(BU)	2,004,800	2,004,800	2,004,900	2,005,200	1,991,600	0.02	0.31
SALES (1000 BU)	252,600	256,610	260,640	264,690	268,870	1.57	2.34
TOTAL SALES							
YEAR END ACCTS	463,792	474,562	485,432	496,501	507,868	2.28	2.58
AVG ANNUAL ACCTS	458,712	469,181	480,002	490,970	502,189		
AVG ANNUAL USE(BU)	2,726	2,736	2,747	2,760	2,773	0.41	0.21
SALES (1000 BU)	1,250,440	1,283,570	1,318,490	1,354,900	1,392,500	2.69	2.82

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-11

DETAILED FORECAST 20 — NATURAL GAS — FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) — LOWER MAINLAND — PAGE 4 OF 4

1983 EDITION REVISION# 0

	1999/00	2000/01	2001/02	2002/03	2003/04	AVG. ANNUAL GROWTH 5 YRS(%)	21 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	5,550	5,400	5,250	5,100	4,950	-2.78	-3.12
AVG ANNUAL ACCTS	5,625	5,475	5,325	5,175	5,025		
AVG ANNUAL USE(BU)	837	840	845	848	852	0.45	0.91
SALES (1000 BU)	4,710	4,600	4,500	4,390	4,280	-2.39	-2.25
RES WITH HEAT							
YEAR END ACCTS	441,100	450,000	459,100	468,300	477,700	2.01	2.37
AVG ANNUAL ACCTS	436,750	445,550	454,550	463,700	473,000		
AVG ANNUAL USE(BU)	1,092	1,086	1,079	1,073	1,067	-0.57	-0.80
SALES (1000 BU)	477,000	483,700	490,400	497,500	504,600	1.43	1.59
GEN WITHOUT HEAT							
YEAR END ACCTS	1,305	1,285	1,265	1,245	1,225	-1.56	-4.18
AVG ANNUAL ACCTS	1,320	1,300	1,280	1,260	1,240		
AVG ANNUAL USE(BU)	18,275	18,525	18,790	19,055	19,330	1.47	3.59
SALES (1000 BU)	24,120	24,080	24,050	24,010	23,970	-0.24	-0.85
GEN WITH HEAT							
YEAR END ACCTS	71,100	74,200	77,300	80,600	83,900	4.29	4.51
AVG ANNUAL ACCTS	69,550	72,650	75,750	78,950	82,250		
AVG ANNUAL USE(BU)	8,400	8,370	8,340	8,320	8,300	-0.31	-0.57
SALES (1000 BU)	584,000	607,800	631,900	656,600	682,500	4.01	3.89
SEASONAL							
YEAR END ACCTS	58	58	59	60	61	1.73	1.68
AVG ANNUAL ACCTS	58	58	59	60	61		
AVG ANNUAL USE(BU)	21,720	21,720	21,860	21,830	21,970	0.33	0.02
SALES (1000 BU)	1,260	1,260	1,290	1,310	1,340	2.06	1.81
BC HYDRO USE							
YEAR END ACCTS	93	94	94	96	96	0.85	0.93
AVG ANNUAL ACCTS	93	94	94	96	96		
AVG ANNUAL USE(BU)	12,370	12,340	12,340	12,400	12,400	0.02	0.30
SALES (1000 BU)	1,150	1,160	1,160	1,190	1,190	0.86	1.23
CNG(FIRM)							
YEAR END ACCTS	170	180	190	198	208	5.39	22.37
AVG ANNUAL ACCTS	165	175	186	195	203		
AVG ANNUAL USE(BU)	400,800	407,000	406,100	410,900	418,600	1.24	7.89
SALES (1000 BU)	66,130	71,220	75,530	80,120	84,970	6.72	34.44
TOTAL FIRM							
YEAR END ACCTS	519,376	531,217	543,258	555,599	568,140	2.27	2.51
AVG ANNUAL ACCTS	513,561	525,302	537,244	549,436	561,875		
AVG ANNUAL USE(BU)	2,256	2,273	2,287	2,303	2,319	0.71	0.42
SALES (1000 BU)	1,158,370	1,193,820	1,228,830	1,265,120	1,302,850	3.00	2.96
CNG(INTERRUP.)							
YEAR END ACCTS	10	10	10	12	12	3.71	12.56
AVG ANNUAL ACCTS	10	10	10	12	12		
AVG ANNUAL USE(BU)	686,000	716,000	749,000	650,800	680,800	0.71	8.62
SALES (1000 BU)	6,860	7,160	7,490	7,810	8,170	4.46	22.26
OTHER INTERRUP.							
YEAR END ACCTS	126	129	130	133	134	1.40	1.45
AVG ANNUAL ACCTS	126	128	130	132	134		
AVG ANNUAL USE(BU)	2,111,100	2,107,800	2,104,600	2,102,300	2,100,000	0.02	0.45
SALES (1000 BU)	266,000	269,800	273,600	277,500	281,400	1.42	2.00
TOTAL INTERRUPT.							
YEAR END ACCTS	136	139	140	145	146	1.58	1.82
AVG ANNUAL ACCTS	136	138	140	144	146		
AVG ANNUAL USE(BU)	2,006,300	2,007,000	2,007,800	1,981,300	1,983,400	-0.08	0.22
SALES (1000 BU)	272,860	276,960	281,090	285,310	289,570	1.49	2.14
TOTAL SALES							
YEAR END ACCTS	519,512	531,356	543,398	555,744	568,286	2.27	2.51
AVG ANNUAL ACCTS	513,697	525,440	537,384	549,580	562,021		
AVG ANNUAL USE(BU)	2,786	2,799	2,810	2,821	2,833	0.43	0.26
SALES (1000 BU)	1,431,230	1,470,780	1,509,920	1,550,430	1,592,420	2.72	2.80

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-12

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES PAGE 1 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

1983 EDITION REVISION# 0 METRO

	FISCAL 1982/83 ACTUAL	FISCAL 1982/83 NORMAL	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	GROWTH RATE (%)
RES WITHOUT HEAT									
YEAR END ACCTS	8,384	8,384	8,400	8,000	7,600	7,200	6,800	6,400	-4.40
AVG ANNUAL ACCTS	8,591	8,591	8,390	8,200	7,800	7,400	7,000	6,600	
AVG ANNUAL USE(BU)	682	690	700	710	720	730	740	750	1.40
SALES (1000 BU)	5,861	5,930	5,870	5,820	5,620	5,400	5,180	4,950	-2.97
RES WITH HEAT									
YEAR END ACCTS	181,432	181,432	187,600	193,700	199,600	204,600	208,600	212,300	2.65
AVG ANNUAL ACCTS	178,414	178,414	184,500	190,650	196,650	202,100	206,600	210,450	
AVG ANNUAL USE(BU)	1,259	1,315	1,325	1,317	1,293	1,272	1,254	1,238	-1.00
SALES (1000 BU)	224,682	234,610	244,500	251,100	254,300	257,100	259,100	260,500	1.76
GEN WITHOUT HEAT									
YEAR END ACCTS	2,630	2,630	2,400	2,200	2,000	1,850	1,700	1,600	-7.95
AVG ANNUAL ACCTS	2,752	2,752	2,515	2,300	2,100	1,925	1,775	1,650	
AVG ANNUAL USE(BU)	7,619	7,200	7,800	8,400	8,800	9,100	9,300	9,400	4.54
SALES (1000 BU)	20,967	19,810	19,620	19,320	18,480	17,520	16,510	15,510	-4.00
GEN WITH HEAT									
YEAR END ACCTS	23,044	23,044	23,600	24,100	24,700	25,500	26,300	27,500	2.99
AVG ANNUAL ACCTS	22,749	22,749	23,320	23,850	24,400	25,100	26,000	27,000	
AVG ANNUAL USE(BU)	10,098	10,350	10,354	10,337	10,268	10,179	10,115	10,025	-0.53
SALES (1000 BU)	229,729	235,450	241,500	246,500	250,500	255,500	263,000	270,700	2.35
SEASONAL									
YEAR END ACCTS	20	20	20	20	21	21	22	22	1.60
AVG ANNUAL ACCTS	19	19	20	20	21	21	22	22	
AVG ANNUAL USE(BU)	25,632	24,000	24,600	25,000	25,300	25,500	25,600	25,700	1.15
SALES (1000 BU)	487	460	490	500	530	540	560	570	3.64
BC HYDRO USE									
YEAR END ACCTS	44	44	45	46	46	47	47	48	1.46
AVG ANNUAL ACCTS	43	43	45	46	46	47	47	48	
AVG ANNUAL USE(BU)	11,511	12,000	12,400	12,800	13,100	13,300	13,400	13,500	1.98
SALES (1000 BU)	495	520	560	590	600	630	630	650	3.79
CNG(FIRM)									
YEAR END ACCTS	3	3	5	7	20	24	31	35	50.60
AVG ANNUAL ACCTS	1	2	4	6	14	22	28	33	
AVG ANNUAL USE(BU)	260,000	84,500	87,500	96,700	163,600	249,100	345,000	426,700	30.98
SALES (1000 BU)	260	170	350	580	2,290	5,480	9,660	14,080	108.78
TOTAL FIRM									
YEAR END ACCTS	215,557	215,557	222,070	228,073	233,987	239,242	243,700	247,905	2.36
AVG ANNUAL ACCTS	212,569	212,570	218,794	225,072	231,031	236,615	241,472	245,803	
AVG ANNUAL USE(BU)	2,270	2,338	2,344	2,330	2,304	2,291	2,297	2,307	-0.22
SALES (1000 BU)	482,481	496,950	512,890	524,410	532,320	542,170	554,640	566,960	2.22
CNG(INTERRUP.)									
YEAR END ACCTS		1	1	2	3	3	3	4	25.99
AVG ANNUAL ACCTS		1	1	2	3	3	3	4	
AVG ANNUAL USE(BU)		120,000	950,000	675,000	600,000	633,300	703,300	625,000	31.66
SALES (1000 BU)		120	950	1,350	1,800	1,900	2,110	2,500	65.88
OTHER INTERRUP.									
YEAR END ACCTS	80	80	84	84	84	84	85	85	1.02
AVG ANNUAL ACCTS	78	78	82	84	84	84	85	85	
AVG ANNUAL USE(BU)	2,169,167	2,016,769	1,967,100	2,016,700	2,117,900	2,170,200	2,198,800	2,254,100	1.87
SALES (1000 BU)	169,195	157,310	161,300	169,400	177,900	182,300	186,900	191,600	3.34
TOTAL INTERRUPT.									
YEAR END ACCTS	80	81	85	86	87	87	88	89	1.58
AVG ANNUAL ACCTS	78	79	83	86	87	87	88	89	
AVG ANNUAL USE(BU)	2,169,200	1,992,800	1,954,800	1,985,500	2,065,500	2,117,200	2,147,800	2,180,900	1.51
SALES (1000 BU)	169,195	157,430	162,250	170,750	179,700	184,200	189,010	194,100	3.55
TOTAL SALES									
YEAR END ACCTS	215,637	215,638	222,155	228,159	234,074	239,329	243,788	247,994	2.36
AVG ANNUAL ACCTS	212,647	212,649	218,877	225,158	231,118	236,702	241,560	245,892	
AVG ANNUAL USE(BU)	3,065	3,077	3,085	3,087	3,081	3,069	3,079	3,095	0.10
SALES (1000 BU)	651,676	654,380	675,140	695,160	712,020	726,370	743,650	761,060	2.55

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-12

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 2 OF 4

1983 EDITION REVISION# 0 METRO

	1989/90	1990/91	1991/92	1992/93	1993/94	AVG. ANNUAL GROWTH 5 YRS(%)	11 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	6,100	5,800	5,500	5,200	4,900	-5.20	-4.77
AVG ANNUAL ACCTS	6,250	5,950	5,650	5,350	5,050		
AVG ANNUAL USE(BU)	755	760	765	770	775	0.66	1.06
SALES (1000 BU)	4,720	4,520	4,320	4,120	3,910	-4.61	-3.72
RES WITH HEAT							
YEAR END ACCTS	215,600	218,700	221,700	224,600	227,500	1.39	2.08
AVG ANNUAL ACCTS	213,950	217,150	220,200	223,150	226,050		
AVG ANNUAL USE(BU)	1,222	1,207	1,195	1,190	1,186	-0.85	-0.93
SALES (1000 BU)	261,400	262,100	263,100	265,500	268,100	0.58	1.22
GEN WITHOUT HEAT							
YEAR END ACCTS	1,500	1,400	1,300	1,200	1,100	-7.22	-7.62
AVG ANNUAL ACCTS	1,550	1,450	1,350	1,250	1,150		
AVG ANNUAL USE(BU)	9,450	9,500	9,525	9,550	9,575	0.37	2.63
SALES (1000 BU)	14,650	13,780	12,860	11,940	11,010	-6.62	-5.20
GEN WITH HEAT							
YEAR END ACCTS	28,600	29,700	30,900	32,100	33,400	3.96	3.43
AVG ANNUAL ACCTS	28,050	29,150	30,300	31,500	32,750		
AVG ANNUAL USE(BU)	9,930	9,845	9,761	9,685	9,610	-0.84	-0.67
SALES (1000 BU)	278,500	287,000	295,800	305,100	314,700	3.06	2.67
SEASONAL							
YEAR END ACCTS	23	23	24	24	25	2.59	2.05
AVG ANNUAL ACCTS	23	23	24	24	25		
AVG ANNUAL USE(BU)	25,770	25,840	25,910	25,980	26,050	0.27	0.75
SALES (1000 BU)	590	590	620	620	650	2.66	3.19
BC HYDRO USE							
YEAR END ACCTS	48	49	49	50	50	0.82	1.17
AVG ANNUAL ACCTS	48	49	49	50	50		
AVG ANNUAL USE(BU)	13,600	13,700	13,800	13,900	14,000	0.73	1.41
SALES (1000 BU)	650	670	680	690	700	1.49	2.74
CNG(FIRM)							
YEAR END ACCTS	41	49	54	62	68	14.21	32.81
AVG ANNUAL ACCTS	38	45	52	58	65		
AVG ANNUAL USE(BU)	453,700	465,800	435,400	421,000	405,500	-1.01	15.32
SALES (1000 BU)	17,240	20,960	22,640	24,420	26,360	13.36	58.17
TOTAL FIRM							
YEAR END ACCTS	251,912	255,721	259,527	263,236	267,043	1.50	1.97
AVG ANNUAL ACCTS	249,909	253,817	257,625	261,382	265,140		
AVG ANNUAL USE(BU)	2,312	2,323	2,329	2,343	2,359	0.45	0.08
SALES (1000 BU)	577,750	589,620	600,020	612,390	625,430	1.98	2.11
CNG(INTERRUP.)							
YEAR END ACCTS	4	5	5	5	6	8.45	17.69
AVG ANNUAL ACCTS	4	5	5	5	6		
AVG ANNUAL USE(BU)	675,000	684,000	706,000	730,000	631,700	0.21	16.30
SALES (1000 BU)	2,700	3,420	3,530	3,650	3,790	8.68	36.87
OTHER INTERRUP.							
YEAR END ACCTS	86	88	89	91	92	1.60	1.28
AVG ANNUAL ACCTS	86	87	89	90	92		
AVG ANNUAL USE(BU)	2,264,000	2,273,600	2,257,300	2,268,900	2,254,300	0.00	1.02
SALES (1000 BU)	194,700	197,800	200,900	204,200	207,400	1.60	2.54
TOTAL INTERRUPT.							
YEAR END ACCTS	90	93	94	96	98	1.95	1.75
AVG ANNUAL ACCTS	90	92	94	95	98		
AVG ANNUAL USE(BU)	2,193,300	2,187,200	2,174,800	2,187,900	2,155,000	-0.24	0.71
SALES (1000 BU)	197,400	201,220	204,430	207,850	211,190	1.70	2.71
TOTAL SALES							
YEAR END ACCTS	252,002	255,814	259,621	263,332	267,141	1.50	1.97
AVG ANNUAL ACCTS	249,999	253,909	257,719	261,477	265,238		
AVG ANNUAL USE(BU)	3,101	3,115	3,121	3,137	3,154	0.38	0.22
SALES (1000 BU)	775,150	790,840	804,450	820,240	836,620	1.91	2.26

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 HERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-12

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES PAGE 3 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 METRO

	1994/95	1995/96	1996/97	1997/98	1998/99	AVG. ANNUAL GROWTH 5 YRS(%)	16 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	4,650	4,400	4,150	3,900	3,650	-5.72	-5.06
AVG ANNUAL ACCTS	4,775	4,525	4,275	4,025	3,775		
AVG ANNUAL USE(BU)	778	781	784	787	790	0.38	0.85
SALES (1000 BU)	3,710	3,530	3,350	3,170	2,980	-5.29	-4.21
RES WITH HEAT							
YEAR END ACCTS	230,500	233,700	236,900	240,100	243,400	1.36	1.85
AVG ANNUAL ACCTS	229,000	232,100	235,300	238,500	241,750		
AVG ANNUAL USE(BU)	1,180	1,175	1,169	1,164	1,159	-0.46	-0.79
SALES (1000 BU)	270,200	272,700	275,100	277,600	280,200	0.89	1.12
GEN WITHOUT HEAT							
YEAR END ACCTS	1,050	1,000	950	900	850	-5.03	-6.82
AVG ANNUAL ACCTS	1,075	1,025	975	925	875		
AVG ANNUAL USE(BU)	9,595	9,615	9,635	9,655	9,675	0.21	1.86
SALES (1000 BU)	10,310	9,860	9,390	8,930	8,470	-5.11	-5.17
GEN WITH HEAT							
YEAR END ACCTS	34,700	36,100	37,500	39,000	40,500	3.93	3.59
AVG ANNUAL ACCTS	34,050	35,400	36,800	38,250	39,750		
AVG ANNUAL USE(BU)	9,538	9,468	9,423	9,386	9,354	-0.54	-0.63
SALES (1000 BU)	324,800	335,200	346,800	359,000	371,800	3.39	2.90
SEASONAL							
YEAR END ACCTS	25	26	26	27	27	1.55	1.89
AVG ANNUAL ACCTS	25	26	26	27	27		
AVG ANNUAL USE(BU)	26,090	26,130	26,170	26,210	26,250	0.15	0.56
SALES (1000 BU)	650	680	680	710	710	1.78	2.75
BC HYDRO USE							
YEAR END ACCTS	51	51	52	52	53	1.17	1.17
AVG ANNUAL ACCTS	51	51	52	52	53		
AVG ANNUAL USE(BU)	14,050	14,100	14,150	14,200	14,250	0.35	1.08
SALES (1000 BU)	720	720	740	740	760	1.66	2.40
CNG(FIRM)							
YEAR END ACCTS	74	81	88	94	100	8.02	24.50
AVG ANNUAL ACCTS	71	78	85	91	97		
AVG ANNUAL USE(BU)	400,600	393,100	388,900	391,400	395,600	-0.49	10.13
SALES (1000 BU)	28,440	30,660	33,060	35,620	38,370	7.80	40.31
TOTAL FIRM							
YEAR END ACCTS	271,050	275,358	279,666	284,073	288,580	1.56	1.84
AVG ANNUAL ACCTS	269,047	273,205	277,513	281,870	286,327		
AVG ANNUAL USE(BU)	2,374	2,391	2,411	2,433	2,456	0.81	0.31
SALES (1000 BU)	638,830	653,350	669,120	685,770	703,290	2.37	2.19
CNG(INTERRUP.)							
YEAR END ACCTS	6	6	6	6	7	3.13	12.93
AVG ANNUAL ACCTS	6	6	6	6	7		
AVG ANNUAL USE(BU)	653,300	678,300	705,000	733,300	657,100	0.79	11.21
SALES (1000 BU)	3,920	4,070	4,230	4,400	4,600	3.95	25.60
OTHER INTERRUP.							
YEAR END ACCTS	93	95	96	98	99	1.48	1.34
AVG ANNUAL ACCTS	93	94	96	97	99		
AVG ANNUAL USE(BU)	2,263,400	2,273,400	2,259,400	2,269,100	2,256,600	0.02	0.70
SALES (1000 BU)	210,500	213,700	216,900	220,100	223,400	1.50	2.22
TOTAL INTERRUPT.							
YEAR END ACCTS	99	101	102	104	106	1.58	1.70
AVG ANNUAL ACCTS	99	100	102	103	106		
AVG ANNUAL USE(BU)	2,165,900	2,177,700	2,167,900	2,179,600	2,150,900	-0.04	0.48
SALES (1000 BU)	214,420	217,770	221,130	224,500	228,000	1.54	2.34
TOTAL SALES							
YEAR END ACCTS	271,149	275,459	279,768	284,177	288,686	1.56	1.84
AVG ANNUAL ACCTS	269,146	273,305	277,615	281,973	286,433		
AVG ANNUAL USE(BU)	3,170	3,187	3,207	3,228	3,251	0.61	0.34
SALES (1000 BU)	853,250	871,120	890,250	910,270	931,290	2.17	2.23

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-12

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES PAGE 4 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 METRO

	1999/00	2000/01	2001/02	2002/03	2003/04	AVG. ANNUAL GROWTH 5 YRS(%)	21 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	3,450	3,250	3,050	2,850	2,650	-6.20	-5.34
AVG ANNUAL ACCTS	3,550	3,350	3,150	2,950	2,750		
AVG ANNUAL USE(BU)	792	794	796	798	800	0.25	0.71
SALES (1000 BU)	2,810	2,660	2,510	2,350	2,200	-5.89	-4.61
RES WITH HEAT							
YEAR END ACCTS	246,700	250,100	253,600	257,100	260,700	1.38	1.74
AVG ANNUAL ACCTS	245,050	248,400	251,850	255,350	258,900		
AVG ANNUAL USE(BU)	1,154	1,149	1,143	1,138	1,133	-0.45	-0.71
SALES (1000 BU)	282,800	285,400	287,900	290,600	293,300	0.92	1.07
GEN WITHOUT HEAT							
YEAR END ACCTS	825	800	775	750	725	-3.13	-5.95
AVG ANNUAL ACCTS	840	815	790	765	740		
AVG ANNUAL USE(BU)	9,690	9,705	9,720	9,735	9,750	0.15	1.45
SALES (1000 BU)	8,140	7,910	7,680	7,450	7,220	-3.14	-4.69
GEN WITH HEAT							
YEAR END ACCTS	42,100	43,700	45,300	47,000	48,700	3.76	3.63
AVG ANNUAL ACCTS	41,300	42,900	44,500	46,150	47,850		
AVG ANNUAL USE(BU)	9,316	9,283	9,253	9,221	9,194	-0.34	-0.56
SALES (1000 BU)	384,800	398,200	411,800	425,500	439,900	3.42	3.02
SEASONAL							
YEAR END ACCTS	28	28	29	29	30	2.13	1.95
AVG ANNUAL ACCTS	28	28	29	29	30		
AVG ANNUAL USE(BU)	26,275	26,300	26,325	26,350	26,375	0.10	0.45
SALES (1000 BU)	740	740	760	760	790	2.16	2.61
BC HYDRO USE							
YEAR END ACCTS	53	54	54	55	55	0.74	1.07
AVG ANNUAL ACCTS	53	54	54	55	55		
AVG ANNUAL USE(BU)	14,275	14,300	14,325	14,350	14,375	0.17	0.86
SALES (1000 BU)	760	770	770	790	790	0.78	2.01
CNG(FIRM)							
YEAR END ACCTS	106	112	119	124	130	5.39	19.66
AVG ANNUAL ACCTS	103	109	116	122	127		
AVG ANNUAL USE(BU)	401,300	408,350	407,000	410,500	418,200	1.12	7.91
SALES (1000 BU)	41,330	44,510	47,210	50,080	53,110	6.72	31.46
TOTAL FIRM							
YEAR END ACCTS	293,262	298,044	302,927	307,908	312,990	1.64	1.79
AVG ANNUAL ACCTS	290,924	295,656	300,489	305,421	310,452		
AVG ANNUAL USE(BU)	2,480	2,504	2,525	2,546	2,568	0.90	0.45
SALES (1000 BU)	721,380	740,190	758,630	777,530	797,310	2.54	2.28
CNG(INTERRUP.)							
YEAR END ACCTS	7	7	7	8	8	2.71	10.41
AVG ANNUAL ACCTS	7	7	7	8	8		
AVG ANNUAL USE(BU)	685,700	715,700	748,600	683,800	715,000	1.70	8.87
SALES (1000 BU)	4,800	5,010	5,240	5,470	5,720	4.45	20.20
OTHER INTERRUP.							
YEAR END ACCTS	100	102	103	105	106	1.38	1.35
AVG ANNUAL ACCTS	100	101	103	104	106		
AVG ANNUAL USE(BU)	2,265,000	2,274,300	2,261,200	2,271,200	2,259,400	0.02	0.54
SALES (1000 BU)	226,500	229,700	232,900	236,200	239,500	1.40	2.02
TOTAL INTERRUPT.							
YEAR END ACCTS	107	109	110	113	114	1.47	1.64
AVG ANNUAL ACCTS	107	108	110	112	114		
AVG ANNUAL USE(BU)	2,161,700	2,173,200	2,164,900	2,157,800	2,151,100	0.00	0.36
SALES (1000 BU)	231,300	234,710	238,140	241,670	245,220	1.47	2.13
TOTAL SALES							
YEAR END ACCTS	293,369	298,153	303,037	308,021	313,104	1.64	1.79
AVG ANNUAL ACCTS	291,031	295,764	300,599	305,533	310,566		
AVG ANNUAL USE(BU)	3,273	3,296	3,316	3,336	3,357	0.64	0.42
SALES (1000 BU)	952,680	974,900	996,770	1,019,200	1,042,530	2.28	2.24

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-13

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES PAGE 1 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 FRASER VALLEY

	FISCAL 1982/83 ACTUAL	FISCAL 1982/83 NORMAL	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	GROWTH RATE (%)
RES WITHOUT HEAT									
YEAR END ACCTS	1,250	1,250	1,300	1,350	1,400	1,450	1,500	1,550	3.65
AVG ANNUAL ACCTS	1,217	1,217	1,275	1,325	1,375	1,425	1,475	1,525	
AVG ANNUAL USE(BU)	818	800	850	870	880	890	895	900	1.98
SALES (1000 BU)	995	970	1,080	1,150	1,210	1,270	1,320	1,370	5.92
RES WITH HEAT									
YEAR END ACCTS	110,378	110,378	114,900	119,700	124,900	130,000	135,100	140,400	4.09
AVG ANNUAL ACCTS	108,225	108,225	112,650	117,300	122,300	127,450	132,550	137,750	
AVG ANNUAL USE(BU)	1,122	1,180	1,188	1,184	1,166	1,148	1,131	1,115	-0.94
SALES (1000 BU)	121,481	127,710	133,800	138,900	142,600	146,300	149,900	153,600	3.12
GEN WITHOUT HEAT									
YEAR END ACCTS	371	371	385	393	401	409	417	425	2.29
AVG ANNUAL ACCTS	362	362	380	390	395	405	415	420	
AVG ANNUAL USE(BU)	25,599	24,500	25,500	28,000	30,000	31,000	31,500	31,750	4.42
SALES (1000 BU)	9,267	8,870	9,690	10,920	11,850	12,560	13,070	13,340	7.04
GEN WITH HEAT									
YEAR END ACCTS	10,181	10,181	10,700	11,200	11,800	12,600	13,600	14,600	6.19
AVG ANNUAL ACCTS	9,998	9,998	10,440	10,950	11,500	12,200	13,100	14,100	
AVG ANNUAL USE(BU)	6,959	7,100	7,292	7,376	7,378	7,339	7,294	7,267	0.39
SALES (1000 BU)	69,575	70,990	76,100	80,800	84,800	89,500	95,600	102,500	6.31
SEASONAL									
YEAR END ACCTS	23	23	24	25	25	25	26	26	2.06
AVG ANNUAL ACCTS	23	23	24	25	25	25	26	26	
AVG ANNUAL USE(BU)	20,870	20,000	17,000	15,000	14,000	14,000	14,500	15,000	-4.68
SALES (1000 BU)	480	460	410	380	350	350	380	390	-2.71
BC HYDRO USE									
YEAR END ACCTS	35	35	34	35	35	35	36	36	0.47
AVG ANNUAL ACCTS	36	36	35	35	35	35	36	36	
AVG ANNUAL USE(BU)	9,944	11,000	10,750	10,550	10,400	10,300	10,200	10,150	-1.33
SALES (1000 BU)	358	400	380	370	360	360	370	370	-1.29
CNG(FIRM)									
YEAR END ACCTS				7	9	16	18	22	999.00
AVG ANNUAL ACCTS				4	8	13	17	20	
AVG ANNUAL USE(BU)				87,500	172,500	252,300	341,200	422,000	999.00
SALES (1000 BU)				350	1,380	3,280	5,800	8,440	0.00
TOTAL FIRM									
YEAR END ACCTS	122,238	122,238	127,343	132,710	138,570	144,535	150,697	157,059	4.27
AVG ANNUAL ACCTS	119,861	119,861	124,804	130,029	135,638	141,553	147,619	153,877	
AVG ANNUAL USE(BU)	1,687	1,747	1,774	1,791	1,788	1,792	1,805	1,820	0.68
SALES (1000 BU)	202,156	209,400	221,460	232,870	242,550	253,620	266,440	280,010	4.96
CNG(INTERRUP.)									
YEAR END ACCTS				1	1	1	1	2	999.00
AVG ANNUAL ACCTS				1	1	1	1	2	
AVG ANNUAL USE(BU)				580,000	770,000	810,000	900,000	535,000	999.00
SALES (1000 BU)				580	770	810	900	1,070	0.00
OTHER INTERRUP.									
YEAR END ACCTS	19	19	22	22	22	22	22	22	2.47
AVG ANNUAL ACCTS	19	19	21	22	22	22	22	22	
AVG ANNUAL USE(BU)	1,598,000	1,484,052	1,166,700	1,295,500	1,372,700	1,418,200	1,454,500	1,500,000	0.18
SALES (1000 BU)	30,362	28,200	24,500	28,500	30,200	31,200	32,000	33,000	2.65
TOTAL INTERRUPT.									
YEAR END ACCTS	19	19	22	23	23	23	23	24	3.97
AVG ANNUAL ACCTS	19	19	21	23	23	23	23	24	
AVG ANNUAL USE(BU)	1,598,000	1,484,200	1,166,700	1,264,300	1,346,500	1,391,700	1,430,400	1,419,600	-0.74
SALES (1000 BU)	30,362	28,200	24,500	29,080	30,970	32,010	32,900	34,070	3.20
TOTAL SALES									
YEAR END ACCTS	122,257	122,257	127,365	132,733	138,593	144,558	150,720	157,083	4.27
AVG ANNUAL ACCTS	119,880	119,880	124,825	130,052	135,661	141,576	147,642	153,901	
AVG ANNUAL USE(BU)	1,940	1,982	1,970	2,014	2,016	2,018	2,027	2,041	0.49
SALES (1000 BU)	232,518	237,600	245,960	261,950	273,520	285,630	299,340	314,080	4.76

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
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7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-13

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 2 OF 4

1983 EDITION REVISION# 0 FRASER VALLEY

	1989/90	1990/91	1991/92	1992/93	1993/94	AVG. ANNUAL GROWTH 5 YRS(%)	11 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	1,600	1,650	1,700	1,750	1,800	3.04	3.37
AVG ANNUAL ACCTS	1,575	1,625	1,675	1,725	1,775		
AVG ANNUAL USE(BU)	902	904	906	908	910	0.22	1.18
SALES (1000 BU)	1,420	1,470	1,520	1,570	1,620	3.41	4.77
RES WITH HEAT							
YEAR END ACCTS	145,300	149,800	154,300	158,900	163,600	3.11	3.64
AVG ANNUAL ACCTS	142,850	147,550	152,050	156,600	161,250		
AVG ANNUAL USE(BU)	1,099	1,086	1,073	1,065	1,058	-1.04	-0.99
SALES (1000 BU)	157,000	160,200	163,100	166,800	170,600	2.12	2.67
GEN WITHOUT HEAT							
YEAR END ACCTS	430	435	440	445	450	1.15	1.77
AVG ANNUAL ACCTS	430	435	440	445	450		
AVG ANNUAL USE(BU)	31,950	32,150	32,350	32,550	32,750	0.62	2.67
SALES (1000 BU)	13,740	13,990	14,230	14,480	14,740	2.02	4.73
GEN WITH HEAT							
YEAR END ACCTS	15,700	16,800	18,000	19,200	20,500	7.02	6.57
AVG ANNUAL ACCTS	15,150	16,250	17,400	18,600	19,850		
AVG ANNUAL USE(BU)	7,220	7,187	7,157	7,140	7,124	-0.40	0.03
SALES (1000 BU)	109,400	116,800	124,500	132,800	141,400	6.65	6.46
SEASONAL							
YEAR END ACCTS	26	27	27	27	28	1.49	1.80
AVG ANNUAL ACCTS	26	27	27	27	28		
AVG ANNUAL USE(BU)	15,250	15,500	15,750	16,000	16,250	1.61	-1.87
SALES (1000 BU)	400	420	430	430	460	3.36	0.00
BC HYDRO USE							
YEAR END ACCTS	36	37	37	37	38	1.09	0.75
AVG ANNUAL ACCTS	36	37	37	37	38		
AVG ANNUAL USE(BU)	10,100	10,050	10,000	9,950	9,900	-0.50	-0.95
SALES (1000 BU)	360	370	370	370	380	0.53	-0.47
CNG(FIRM)							
YEAR END ACCTS	26	29	33	37	41	13.26	0.00
AVG ANNUAL ACCTS	24	28	31	35	39		
AVG ANNUAL USE(BU)	431,300	448,900	438,100	418,900	405,400	-0.80	0.00
SALES (1000 BU)	10,350	12,570	13,580	14,660	15,810	13.38	0.00
TOTAL FIRM							
YEAR END ACCTS	163,118	168,778	174,537	180,396	186,457	3.49	3.91
AVG ANNUAL ACCTS	160,091	165,952	171,660	177,469	183,430		
AVG ANNUAL USE(BU)	1,828	1,843	1,851	1,866	1,881	0.66	0.67
SALES (1000 BU)	292,670	305,820	317,730	331,110	345,010	4.26	4.64
CNG(INTERRUP.)							
YEAR END ACCTS	2	2	3	3	3	8.45	0.00
AVG ANNUAL ACCTS	2	2	3	3	3		
AVG ANNUAL USE(BU)	580,000	735,000	503,300	523,300	540,000	0.19	0.00
SALES (1000 BU)	1,160	1,470	1,510	1,570	1,620	8.65	0.00
OTHER INTERRUP.							
YEAR END ACCTS	22	23	23	24	24	1.76	2.15
AVG ANNUAL ACCTS	22	23	23	24	24		
AVG ANNUAL USE(BU)	1,527,300	1,482,600	1,508,700	1,470,800	1,495,800	-0.06	0.07
SALES (1000 BU)	33,600	34,100	34,700	35,300	35,900	1.70	2.22
TOTAL INTERRUPT.							
YEAR END ACCTS	24	25	26	27	27	2.38	3.25
AVG ANNUAL ACCTS	24	25	26	27	27		
AVG ANNUAL USE(BU)	1,448,300	1,422,800	1,392,700	1,365,600	1,389,600	-0.43	-0.60
SALES (1000 BU)	34,760	35,570	36,210	36,870	37,520	1.95	2.63
TOTAL SALES							
YEAR END ACCTS	163,142	168,803	174,563	180,423	186,484	3.49	3.91
AVG ANNUAL ACCTS	160,115	165,977	171,686	177,496	183,457		
AVG ANNUAL USE(BU)	2,045	2,057	2,062	2,073	2,085	0.43	0.46
SALES (1000 BU)	327,430	341,390	353,940	367,980	382,530	4.02	4.42

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-13

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES PAGE 3 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 FRASER VALLEY

	1994/95	1995/96	1996/97	1997/98	1998/99	AVG. ANNUAL GROWTH 5 YRS(%)	16 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	1,850	1,900	1,950	2,000	2,050	2.64	3.14
AVG ANNUAL ACCTS	1,825	1,875	1,925	1,975	2,025		
AVG ANNUAL USE(BU)	911	912	913	914	915	0.11	0.84
SALES (1000 BU)	1,660	1,710	1,760	1,810	1,850	2.69	4.12
RES WITH HEAT							
YEAR END ACCTS	168,400	173,400	178,500	183,700	189,000	2.93	3.42
AVG ANNUAL ACCTS	166,000	170,900	175,950	181,100	186,350		
AVG ANNUAL USE(BU)	1,050	1,042	1,034	1,027	1,019	-0.75	-0.91
SALES (1000 BU)	174,300	178,100	181,900	186,000	189,900	2.17	2.51
GEN WITHOUT HEAT							
YEAR END ACCTS	455	460	465	470	475	1.09	1.56
AVG ANNUAL ACCTS	455	460	465	470	475		
AVG ANNUAL USE(BU)	32,850	32,950	33,050	33,150	33,250	0.30	1.93
SALES (1000 BU)	14,950	15,160	15,370	15,580	15,790	1.39	3.67
GEN WITH HEAT							
YEAR END ACCTS	21,800	23,200	24,600	26,000	27,500	6.05	6.41
AVG ANNUAL ACCTS	21,150	22,500	23,900	25,300	26,750		
AVG ANNUAL USE(BU)	7,104	7,084	7,073	7,068	7,062	-0.17	-0.03
SALES (1000 BU)	150,200	159,400	169,000	178,800	188,900	5.96	6.31
SEASONAL							
YEAR END ACCTS	28	28	29	29	29	0.70	1.46
AVG ANNUAL ACCTS	28	28	29	29	29		
AVG ANNUAL USE(BU)	16,450	16,650	16,850	17,050	17,250	1.20	-0.92
SALES (1000 BU)	460	470	490	490	500	1.68	0.52
BC HYDRO USE							
YEAR END ACCTS	38	38	39	39	39	0.52	0.68
AVG ANNUAL ACCTS	38	38	39	39	39		
AVG ANNUAL USE(BU)	9,875	9,850	9,825	9,800	9,775	-0.25	-0.74
SALES (1000 BU)	380	370	380	380	380	0.00	-0.32
CNG(FIRM)							
YEAR END ACCTS	45	49	53	57	60	7.91	0.00
AVG ANNUAL ACCTS	43	47	51	55	59		
AVG ANNUAL USE(BU)	396,700	391,500	388,800	388,700	390,200	-0.76	0.00
SALES (1000 BU)	17,060	18,400	19,830	21,380	23,020	7.80	0.00
TOTAL FIRM							
YEAR END ACCTS	192,616	199,075	205,636	212,295	219,153	3.28	3.72
AVG ANNUAL ACCTS	189,539	195,848	202,359	208,968	215,727		
AVG ANNUAL USE(BU)	1,894	1,908	1,921	1,935	1,948	0.70	0.68
SALES (1000 BU)	359,010	373,610	388,730	404,440	420,340	4.03	4.45
CNG(INTERRUP.)							
YEAR END ACCTS	3	3	3	3	3	0.00	0.00
AVG ANNUAL ACCTS	3	3	3	3	3		
AVG ANNUAL USE(BU)	560,000	580,000	603,300	630,000	656,700	3.99	0.00
SALES (1000 BU)	1,680	1,740	1,810	1,890	1,970	3.99	0.00
OTHER INTERRUP.							
YEAR END ACCTS	24	25	25	26	26	1.61	1.98
AVG ANNUAL ACCTS	24	25	25	26	26		
AVG ANNUAL USE(BU)	1,520,800	1,484,000	1,508,000	1,473,100	1,496,200	0.01	0.05
SALES (1000 BU)	36,500	37,100	37,700	38,300	38,900	1.62	2.03
TOTAL INTERRUPT.							
YEAR END ACCTS	27	28	28	29	29	1.44	2.68
AVG ANNUAL ACCTS	27	28	28	29	29		
AVG ANNUAL USE(BU)	1,414,100	1,387,100	1,411,100	1,385,900	1,409,300	0.28	-0.32
SALES (1000 BU)	38,180	38,840	39,510	40,190	40,870	1.73	2.35
TOTAL SALES							
YEAR END ACCTS	192,643	199,103	205,664	212,324	219,182	3.28	3.72
AVG ANNUAL ACCTS	189,566	195,876	202,387	208,997	215,756		
AVG ANNUAL USE(BU)	2,095	2,106	2,116	2,127	2,138	0.50	0.47
SALES (1000 BU)	397,190	412,450	428,240	444,630	461,210	3.81	4.23

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-13

DETAILED FORECAST — 1983 EDITION REVISION# 0

NATURAL GAS

20 FISCAL YEAR PROBABLE PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

FRASER VALLEY

	1999/00	2000/01	2001/02	2002/03	2003/04	AVG. ANNUAL GROWTH 5 YRS(%)	21 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	2,100	2,150	2,200	2,250	2,300	2.33	2.95
AVG ANNUAL ACCTS	2,075	2,125	2,175	2,225	2,275		
AVG ANNUAL USE(BU)	915	915	915	915	915	0.00	0.64
SALES (1000 BU)	1,900	1,940	1,990	2,040	2,080	2.37	3.70
RES WITH HEAT						2.80	3.27
YEAR END ACCTS	194,400	199,900	205,500	211,200	217,000		
AVG ANNUAL ACCTS	191,700	197,150	202,700	208,350	214,100		
AVG ANNUAL USE(BU)	1,013	1,006	999	993	987	-0.64	-0.85
SALES (1000 BU)	194,200	198,300	202,500	206,900	211,300	2.16	2.43
GEN WITHOUT HEAT						1.03	1.43
YEAR END ACCTS	480	485	490	495	500		
AVG ANNUAL ACCTS	480	485	490	495	500		
AVG ANNUAL USE(BU)	33,300	33,350	33,400	33,450	33,500	0.15	1.50
SALES (1000 BU)	15,980	16,170	16,370	16,560	16,750	1.19	3.07
GEN WITH HEAT						5.06	6.09
YEAR END ACCTS	29,000	30,500	32,000	33,600	35,200		
AVG ANNUAL ACCTS	28,250	29,750	31,250	32,800	34,400		
AVG ANNUAL USE(BU)	7,053	7,047	7,044	7,045	7,051	-0.03	-0.03
SALES (1000 BU)	199,200	209,600	220,100	231,100	242,600	5.13	6.03
SEASONAL						1.34	1.43
YEAR END ACCTS	30	30	30	31	31		
AVG ANNUAL ACCTS	30	30	30	31	31		
AVG ANNUAL USE(BU)	17,350	17,450	17,550	17,650	17,750	0.57	-0.57
SALES (1000 BU)	520	520	530	550	550	1.92	0.85
BC HYDRO USE						1.01	0.76
YEAR END ACCTS	40	40	40	41	41		
AVG ANNUAL ACCTS	40	40	40	41	41		
AVG ANNUAL USE(BU)	9,775	9,775	9,775	9,775	9,775	0.00	-0.56
SALES (1000 BU)	390	390	390	400	400	1.03	0.00
CNG(FIRM)						5.39	0.00
YEAR END ACCTS	64	68	71	74	78		
AVG ANNUAL ACCTS	62	66	70	73	76		
AVG ANNUAL USE(BU)	400,000	404,700	404,600	411,500	419,200	1.44	0.00
SALES (1000 BU)	24,800	26,710	28,320	30,040	31,860	6.72	0.00
TOTAL FIRM						3.09	3.57
YEAR END ACCTS	226,114	233,173	240,331	247,691	255,150		
AVG ANNUAL ACCTS	222,637	229,646	236,755	244,015	251,423		
AVG ANNUAL USE(BU)	1,963	1,975	1,986	1,998	2,011	0.64	0.67
SALES (1000 BU)	436,990	453,630	470,200	487,590	505,540	3.76	4.29
CNG(INTERRUP.)						5.92	0.00
YEAR END ACCTS	3	3	3	4	4		
AVG ANNUAL ACCTS	3	3	3	4	4		
AVG ANNUAL USE(BU)	686,700	716,700	750,000	585,000	612,500	-1.38	0.00
SALES (1000 BU)	2,060	2,150	2,250	2,340	2,450	4.46	0.00
OTHER INTERRUP.						1.49	1.86
YEAR END ACCTS	26	27	27	28	28		
AVG ANNUAL ACCTS	26	27	27	28	28		
AVG ANNUAL USE(BU)	1,519,200	1,485,200	1,507,400	1,475,000	1,496,400	0.00	0.04
SALES (1000 BU)	39,500	40,100	40,700	41,300	41,900	1.50	1.90
TOTAL INTERRUPT.						1.99	2.51
YEAR END ACCTS	29	30	30	32	32		
AVG ANNUAL ACCTS	29	30	30	32	32		
AVG ANNUAL USE(BU)	1,433,100	1,408,300	1,431,700	1,363,800	1,385,900	-0.33	-0.33
SALES (1000 BU)	41,560	42,250	42,950	43,640	44,350	1.65	2.18
TOTAL SALES						3.09	3.57
YEAR END ACCTS	226,143	233,203	240,361	247,723	255,182		
AVG ANNUAL ACCTS	222,666	229,676	236,785	244,047	251,455		
AVG ANNUAL USE(BU)	2,149	2,159	2,167	2,177	2,187	0.45	0.47
SALES (1000 BU)	478,550	495,880	513,150	531,230	549,890	3.58	4.08

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
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7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-14

B. C. HYDRO

COMPARISON OF ACTUAL GAS SALES WITH PROBABLE PROJECTIONS

LOWER MAINLAND

(Thousand BU)[a,b]

FORECAST MADE		FOR FISCAL YEARS										
	1976/77	1977/78	1978/79	1979/80	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88
FALL: 1976	823 550	890 380	987 530	1 060 880	1 136 700							
	A N	A N	A N	A N	A N							
[c]	2.2 0.9	6.9 8.7	13.6 17.0	21.8 23.6	32.2 27.0							
FALL: 1977		839 000	904 200	943 050	978 110	1 018 380						
		A N	A N	A N	A N	A N						
[c]		0.7 2.4	4.0 7.2	8.2 9.9	13.8 9.3	8.4 8.5						
FALL: 1978			868 530	915 700	951 690	987 240	1 023 230					
			A N	A N	A N	A N	A N					
[c]			-0.5 2.9	5.1 6.7	10.7 6.3	5.1 5.2	15.7 14.7					
FALL: 1979				888 310	923 190	962 260	998 890	1 037 750				
				A N	A N	A N	A N					
[c]				2.0 3.5	7.4 3.1	2.4 2.6	13.0 12.0					
FALL: 1980					887 080	928 660	972 920	1 014 890	1 057 410			
					A N	A N	A N					
[c]					3.2 -0.9	-1.2 -1.0	10.0 9.1					
FALL: 1981						923 590	964 910	1 008 860	1 045 240	1 081 840		
						A N	A N					
[c]						-1.7 -1.6	9.1 8.2					
FALL: 1982							945 690	982 570	1 018 030	1 044 800	1 077 050	
							A N					
							7.0 6.0					
FALL: 1983								921 100	957 110	985 540	1 012 000	1 042 990
ACTUAL: not normalized for weather and standard interruption	805 828	833 039	869 040	871 191	859 773	939 697	884 194					
ACTUAL: normalized for weather and standard interruption	816 185	819 036	843 850	858 350	895 232	938 225	891 980					

[a] Annual Sales figures do not include unaccounted for gas.
[b] BU = Billing Unit = 100 000 kilojoules
[c] Difference between forecast made 1 to 5 years prior to the year indicated divided by actual or normalized sales and expressed as a percentage. A negative sign indicates that the forecast is too low.

HST184 11 July 1983

HST184

TABLE 11-15

B.C. Hydro

PROJECTION OF PROBABLE GAS SALES
VANCOUVER ISLAND
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

PREPARED BY B.P. Sessions, Victoria

DATE 11 July 1983

DESCRIPTION	FISCAL YEARS											
		PROJECTION										
	ACTUAL 1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94
RESIDENTIAL												
ACCOUNTS AT YEAR END	2 882	2 842	2 812	2 787	2 787	2 787	2 787	2 787	2 787	2 787	2 787	2 787
AVERAGE ACCOUNTS FOR YEAR	2 892	2 862	2 827	2 799	2 799	2 799	2 799	2 799	2 799	2 799	2 799	2 799
ANNUAL USE PER ACCOUNT - BU	289	290	292	294	294	294	294	294	294	294	294	294
SALES - THOUSAND BU	835	830	825	820	820	820	820	820	820	820	820	820
COMMERCIAL - INDUSTRIAL												
ACCOUNTS AT YEAR END	1 171	1 174	1 180	1 187	1 187	1 187	1 187	1 187	1 187	1 187	1 187	1 187
AVERAGE ACCOUNTS FOR YEAR	1 165	1 172	1 177	1 184	1 184	1 184	1 184	1 184	1 184	1 184	1 184	1 184
ANNUAL USE PER ACCOUNT - BU	2 072	2 713	2 707	2 690	2 690	2 690	2 690	2 690	2 690	2 690	2 690	2 690
SALES - THOUSAND BU	2 414	3 181	3 186	3 191	3 191	3 191	3 191	3 191	3 191	3 191	3 191	3 191
B.C. HYDRO USE												
ACCOUNTS AT YEAR END	2	2	2	2	2	2	2	2	2	2	2	2
AVERAGE ACCOUNTS FOR YEAR	3	2	2	2	2	2	2	2	2	2	2	2
ANNUAL USE PER ACCOUNT - BU	1 418	1 420	1 420	1 420	1 420	1 420	1 420	1 420	1 420	1 420	1 420	1 420
SALES - THOUSAND BU	4	3	3	3	3	3	3	3	3	3	3	3
TOTAL SALES												
ACCOUNTS AT YEAR END	4 055	4 018	3 994	3 976	3 976	3 976	3 976	3 976	3 976	3 976	3 976	3 976
AVERAGE ACCOUNTS FOR YEAR	4 060	4 036	4 006	3 985	3 985	3 985	3 985	3 985	3 985	3 985	3 985	3 985
SALES - THOUSAND BU	3 253	4 014	4 014	4 014	4 014	4 014	4 014	4 014	4 014	4 014	4 014	4 014

BU - BILLING UNIT = 100,000 KILOJOULES

GAS
HIGH PROJECTION

TABLE 11-16

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR HIGH PROJECTION OF ACCOUNTS AND SALES PAGE 1 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

1983 EDITION REVISION# 0 LOWER MAINLAND

	FISCAL 1982/83 ACTUAL	FISCAL 1982/83 NORMAL	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	GROWTH RATE (%)
RES WITHOUT HEAT									
YEAR END ACCTS	9,634	9,634	9,700	9,350	9,000	8,650	8,300	7,950	-3.15
AVG ANNUAL ACCTS	9,808	9,808	9,665	9,525	9,175	8,825	8,475	8,125	
AVG ANNUAL USE(BU)	699	704	719	732	744	756	767	778	1.68
SALES (1000 BU)	6,856	6,900	6,950	6,970	6,830	6,670	6,500	6,320	-1.45
RES WITH HEAT									
YEAR END ACCTS	291,810	291,810	303,600	315,900	328,300	338,200	347,500	356,800	3.41
AVG ANNUAL ACCTS	286,639	286,639	297,700	309,750	322,100	333,250	342,850	352,150	
AVG ANNUAL USE(BU)	1,208	1,264	1,277	1,277	1,269	1,259	1,251	1,242	-0.29
SALES (1000 BU)	346,163	362,320	380,200	395,700	408,800	419,600	428,800	437,200	3.18
GEN WITHOUT HEAT									
YEAR END ACCTS	3,001	3,001	2,785	2,593	2,401	2,259	2,117	2,025	-6.35
AVG ANNUAL ACCTS	3,114	3,114	2,895	2,690	2,495	2,330	2,190	2,070	
AVG ANNUAL USE(BU)	9,710	9,210	10,125	11,240	12,155	12,910	13,505	13,935	7.15
SALES (1000 BU)	30,234	28,680	29,310	30,240	30,330	30,080	29,580	28,850	0.10
GEN WITH HEAT									
YEAR END ACCTS	33,225	33,225	34,300	35,800	37,500	39,600	42,100	44,700	5.07
AVG ANNUAL ACCTS	32,747	32,747	33,760	35,050	36,650	38,550	40,850	43,400	
AVG ANNUAL USE(BU)	9,140	9,360	9,430	9,460	9,440	9,420	9,410	9,380	0.04
SALES (1000 BU)	299,304	306,440	318,300	331,500	346,100	363,200	384,300	407,300	4.86
SEASONAL									
YEAR END ACCTS	43	43	44	45	46	46	48	48	1.85
AVG ANNUAL ACCTS	42	42	44	45	46	46	48	48	
AVG ANNUAL USE(BU)	23,020	21,900	20,450	19,560	19,130	19,350	19,580	20,000	-1.50
SALES (1000 BU)	967	920	900	880	880	890	940	960	0.71
BC HYDRO USE									
YEAR END ACCTS	79	79	79	81	81	82	83	84	1.03
AVG ANNUAL ACCTS	79	79	80	81	81	82	83	84	
AVG ANNUAL USE(BU)	10,800	11,650	11,750	11,850	11,850	12,070	12,050	12,140	0.69
SALES (1000 BU)	853	920	940	960	960	990	1,000	1,020	1.73
CNG(FIRM)									
YEAR END ACCTS	3	3	5	14	29	40	49	57	63.35
AVG ANNUAL ACCTS	1	2	4	10	22	35	45	53	
AVG ANNUAL USE(BU)	260,000	85,000	87,500	93,000	166,800	250,300	343,600	424,900	30.76
SALES (1000 BU)	260	170	350	930	3,670	8,760	15,460	22,520	125.78
TOTAL FIRM									
YEAR END ACCTS	337,795	337,795	350,513	363,783	377,357	388,877	400,197	411,664	3.35
AVG ANNUAL ACCTS	332,430	332,431	344,148	357,151	370,569	383,118	394,541	405,930	
AVG ANNUAL USE(BU)	2,059	2,125	2,141	2,148	2,152	2,167	2,196	2,227	0.78
SALES (1000 BU)	684,637	706,350	736,950	767,180	797,570	830,190	866,580	904,170	4.20
CNG(INTERRUP.)									
YEAR END ACCTS		1	1	3	4	4	4	6	34.80
AVG ANNUAL ACCTS		1	1	3	4	4	4	6	
AVG ANNUAL USE(BU)		120,000	950,000	643,300	642,500	677,500	752,500	595,000	30.58
SALES (1000 BU)		120	950	1,930	2,570	2,710	3,010	3,570	76.03
OTHER INTERRUP.									
YEAR END ACCTS	99	99	106	106	106	106	107	107	1.30
AVG ANNUAL ACCTS	97	97	103	106	106	106	107	107	
AVG ANNUAL USE(BU)	2,057,300	1,912,500	1,813,600	1,880,200	1,986,800	2,043,400	2,085,000	2,143,900	1.92
SALES (1000 BU)	199,557	185,510	186,800	199,300	210,600	216,600	223,100	229,400	3.60
TOTAL INTERRUPT.									
YEAR END ACCTS	99	100	107	109	110	110	111	113	2.06
AVG ANNUAL ACCTS	97	98	104	109	110	110	111	113	
AVG ANNUAL USE(BU)	2,057,300	1,894,200	1,805,300	1,846,100	1,937,900	1,993,700	2,037,000	2,061,700	1.42
SALES (1000 BU)	199,557	185,630	187,750	201,230	213,170	219,310	226,110	232,970	3.86
TOTAL SALES									
YEAR END ACCTS	337,894	337,895	350,620	363,892	377,467	388,987	400,308	411,777	3.35
AVG ANNUAL ACCTS	332,527	332,529	344,252	357,260	370,679	383,228	394,652	406,043	
AVG ANNUAL USE(BU)	2,659	2,682	2,686	2,711	2,727	2,739	2,769	2,801	0.73
SALES (1000 BU)	884,194	891,980	924,700	968,410	1,010,740	1,049,500	1,092,690	1,137,140	4.13

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-16

DETAILED FORECAST 20 FISCAL YEAR HIGH — NATURAL GAS — PROJECTION OF ACCOUNTS AND SALES — PAGE 2 OF 4
1983 EDITION REVISION# 0
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
LOWER MAINLAND

	1989/90	1990/91	1991/92	1992/93	1993/94	AVG. ANNUAL GROWTH 5 YRS(%)	11 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	7,700	7,450	7,200	6,950	6,700	-3.36	-3.25
AVG ANNUAL ACCTS	7,825	7,575	7,325	7,075	6,825		
AVG ANNUAL USE(BU)	785	791	797	804	810	0.81	1.28
SALES (1000 BU)	6,140	5,990	5,840	5,690	5,530	-2.64	-1.99
RES WITH HEAT							
YEAR END ACCTS	365,200	373,500	381,700	389,900	398,200	2.22	2.87
AVG ANNUAL ACCTS	361,000	369,350	377,600	385,800	394,050		
AVG ANNUAL USE(BU)	1,231	1,221	1,212	1,204	1,197	-0.74	-0.49
SALES (1000 BU)	444,500	451,100	457,800	464,500	471,500	1.52	2.42
GEN WITHOUT HEAT							
YEAR END ACCTS	1,930	1,835	1,740	1,645	1,550	-5.21	-5.83
AVG ANNUAL ACCTS	1,980	1,885	1,790	1,695	1,600		
AVG ANNUAL USE(BU)	14,340	14,730	15,135	15,585	16,095	2.92	5.21
SALES (1000 BU)	28,390	27,770	27,090	26,420	25,750	-2.25	-0.97
GEN WITH HEAT							
YEAR END ACCTS	47,500	50,300	53,300	56,300	59,500	5.89	5.44
AVG ANNUAL ACCTS	46,100	48,900	51,800	54,800	57,900		
AVG ANNUAL USE(BU)	9,350	9,330	9,320	9,310	9,310	-0.15	-0.05
SALES (1000 BU)	431,200	456,400	482,700	510,200	538,900	5.76	5.27
SEASONAL							
YEAR END ACCTS	49	50	51	51	53	2.00	1.92
AVG ANNUAL ACCTS	49	50	51	51	53		
AVG ANNUAL USE(BU)	20,200	20,200	20,590	20,590	20,940	0.92	-0.41
SALES (1000 BU)	990	1,010	1,050	1,050	1,110	2.95	1.72
BC HYDRO USE							
YEAR END ACCTS	84	86	86	87	88	0.93	0.99
AVG ANNUAL ACCTS	84	86	86	87	88		
AVG ANNUAL USE(BU)	12,020	12,090	12,210	12,180	12,270	0.21	0.47
SALES (1000 BU)	1,010	1,040	1,050	1,060	1,080	1.15	1.47
CNG(FIRM)							
YEAR END ACCTS	67	78	87	99	109	13.84	38.63
AVG ANNUAL ACCTS	62	73	83	93	104		
AVG ANNUAL USE(BU)	445,000	459,300	436,400	420,200	405,500	-0.93	15.26
SALES (1000 BU)	27,590	33,530	36,220	39,080	42,170	13.37	65.08
TOTAL FIRM							
YEAR END ACCTS	422,530	433,299	444,164	455,032	466,200	2.52	2.97
AVG ANNUAL ACCTS	417,100	427,919	438,735	449,601	460,620		
AVG ANNUAL USE(BU)	2,253	2,283	2,306	2,331	2,358	1.15	0.95
SALES (1000 BU)	939,820	976,840	1,011,750	1,048,000	1,086,040	3.73	3.99
CNG(INTERRUP.)							
YEAR END ACCTS	6	7	8	8	9	8.45	22.11
AVG ANNUAL ACCTS	6	7	8	8	9		
AVG ANNUAL USE(BU)	643,300	698,600	630,000	652,500	601,100	0.20	15.78
SALES (1000 BU)	3,860	4,890	5,040	5,220	5,410	8.67	41.37
OTHER INTERRUP.							
YEAR END ACCTS	110	111	114	116	118	1.98	1.61
AVG ANNUAL ACCTS	109	111	113	115	118		
AVG ANNUAL USE(BU)	2,145,000	2,146,800	2,149,600	2,152,200	2,137,300	-0.06	1.02
SALES (1000 BU)	233,800	238,300	242,900	247,500	252,200	1.91	2.63
TOTAL INTERRUPT.							
YEAR END ACCTS	116	118	122	124	127	2.36	2.20
AVG ANNUAL ACCTS	115	118	121	123	127		
AVG ANNUAL USE(BU)	2,066,600	2,060,900	2,049,100	2,054,600	2,028,400	-0.33	0.62
SALES (1000 BU)	237,660	243,190	247,940	252,720	257,610	2.03	3.02
TOTAL SALES							
YEAR END ACCTS	422,646	433,417	444,286	455,156	466,327	2.52	2.97
AVG ANNUAL ACCTS	417,215	428,037	438,856	449,724	460,747		
AVG ANNUAL USE(BU)	2,822	2,850	2,870	2,892	2,916	0.81	0.76
SALES (1000 BU)	1,177,480	1,220,030	1,259,690	1,300,720	1,343,650	3.39	3.79

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-16

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR HIGH PROJECTION OF ACCOUNTS AND SALES PAGE 3 OF 4

(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

1983 EDITION REVISION# 0 LOWER MAINLAND

	1994/95	1995/96	1996/97	1997/98	1998/99	AVG. ANNUAL GROWTH 5 YRS(%)	16 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	6,500	6,300	6,100	5,900	5,700	-3.18	-3.23
AVG ANNUAL ACCTS	6,600	6,400	6,200	6,000	5,800		
AVG ANNUAL USE(BU)	814	819	824	830	833	0.56	1.06
SALES (1000 BU)	5,370	5,240	5,110	4,980	4,830	-2.67	-2.20
RES WITH HEAT							
YEAR END ACCTS	406,700	415,600	424,600	433,700	443,000	2.16	2.64
AVG ANNUAL ACCTS	402,450	411,150	420,100	429,150	438,350		
AVG ANNUAL USE(BU)	1,189	1,182	1,178	1,173	1,169	-0.47	-0.49
SALES (1000 BU)	478,400	485,800	494,800	503,600	512,600	1.69	2.19
GEN WITHOUT HEAT							
YEAR END ACCTS	1,505	1,460	1,415	1,370	1,325	-3.09	-4.98
AVG ANNUAL ACCTS	1,530	1,485	1,440	1,395	1,350		
AVG ANNUAL USE(BU)	16,510	16,850	17,195	17,570	17,970	2.23	4.27
SALES (1000 BU)	25,260	25,020	24,760	24,510	24,260	-1.19	-1.04
GEN WITH HEAT							
YEAR END ACCTS	62,700	66,100	69,500	73,000	76,600	5.18	5.36
AVG ANNUAL ACCTS	61,100	64,400	67,800	71,250	74,800		
AVG ANNUAL USE(BU)	9,300	9,290	9,290	9,290	9,290	-0.04	-0.05
SALES (1000 BU)	568,000	598,200	629,700	661,900	695,200	5.23	5.25
SEASONAL							
YEAR END ACCTS	53	54	55	56	56	1.11	1.66
AVG ANNUAL ACCTS	53	54	55	56	56		
AVG ANNUAL USE(BU)	20,940	21,300	21,270	21,430	21,610	0.63	-0.08
SALES (1000 BU)	1,110	1,150	1,170	1,200	1,210	1.74	1.73
BC HYDRO USE							
YEAR END ACCTS	89	89	91	91	92	0.89	0.96
AVG ANNUAL ACCTS	89	89	91	91	92		
AVG ANNUAL USE(BU)	12,360	12,250	12,310	12,310	12,390	0.19	0.39
SALES (1000 BU)	1,100	1,090	1,120	1,120	1,140	1.09	1.35
CNG(FIRM)							
YEAR END ACCTS	119	130	141	151	160	7.98	28.21
AVG ANNUAL ACCTS	114	125	136	146	156		
AVG ANNUAL USE(BU)	399,100	392,500	388,900	390,400	393,500	-0.60	10.05
SALES (1000 BU)	45,500	49,060	52,890	57,000	61,390	7.80	44.50
TOTAL FIRM							
YEAR END ACCTS	477,666	489,733	501,902	514,268	526,933	2.48	2.82
AVG ANNUAL ACCTS	471,936	483,703	495,822	508,068	520,604		
AVG ANNUAL USE(BU)	2,383	2,410	2,439	2,469	2,498	1.16	1.02
SALES (1000 BU)	1,124,740	1,165,560	1,209,550	1,254,310	1,300,630	3.67	3.89
CNG(INTERRUP.)							
YEAR END ACCTS	9	9	9	9	10	2.13	15.48
AVG ANNUAL ACCTS	9	9	9	9	10		
AVG ANNUAL USE(BU)	622,200	645,600	671,100	698,900	657,000	1.79	11.21
SALES (1000 BU)	5,600	5,810	6,040	6,290	6,570	3.96	28.42
OTHER INTERRUP.							
YEAR END ACCTS	120	123	125	127	129	1.80	1.67
AVG ANNUAL ACCTS	119	122	124	127	128		
AVG ANNUAL USE(BU)	2,158,000	2,142,600	2,146,800	2,133,900	2,156,300	0.18	0.75
SALES (1000 BU)	256,800	261,400	266,200	271,000	276,000	1.82	2.51
TOTAL INTERRUPT.							
YEAR END ACCTS	129	132	134	136	139	1.82	2.08
AVG ANNUAL ACCTS	128	131	133	136	138		
AVG ANNUAL USE(BU)	2,050,000	2,039,800	2,046,900	2,038,900	2,047,600	0.19	0.49
SALES (1000 BU)	262,400	267,210	272,240	277,290	282,570	1.87	2.66
TOTAL SALES							
YEAR END ACCTS	477,795	489,865	502,036	514,404	527,072	2.48	2.82
AVG ANNUAL ACCTS	472,064	483,834	495,955	508,224	520,742		
AVG ANNUAL USE(BU)	2,938	2,961	2,988	3,014	3,040	0.84	0.79
SALES (1000 BU)	1,387,140	1,432,770	1,481,790	1,531,600	1,583,200	3.34	3.65

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-16

DETAILED FORECAST 20 — NATURAL GAS — FISCAL YEAR HIGH PROJECTION OF ACCOUNTS AND SALES — PAGE 4 OF 4

1983 EDITION REVISION# 0 — (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

LOWER MAINLAND

	1999/00	2000/01	2001/02	2002/03	2003/04	AVG. ANNUAL GROWTH 5 YRS(%)	21 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	5,550	5,400	5,250	5,100	4,950	-2.78	-3.12
AVG ANNUAL ACCTS	5,625	5,475	5,325	5,175	5,025		
AVG ANNUAL USE(BU)	837	840	845	848	852	0.45	0.91
SALES (1000 BU)	4,710	4,600	4,500	4,390	4,280	-2.39	-2.25
RES WITH HEAT							
YEAR END ACCTS	452,400	462,000	471,800	481,700	491,800	2.11	2.52
AVG ANNUAL ACCTS	447,700	457,200	466,900	476,750	486,750		
AVG ANNUAL USE(BU)	1,164	1,160	1,155	1,150	1,147	-0.38	-0.46
SALES (1000 BU)	521,300	530,200	539,500	548,500	558,100	1.72	2.08
GEN WITHOUT HEAT							
YEAR END ACCTS	1,305	1,285	1,265	1,245	1,225	-1.56	-4.18
AVG ANNUAL ACCTS	1,320	1,300	1,280	1,260	1,240		
AVG ANNUAL USE(BU)	18,275	18,525	18,790	19,055	19,330	1.47	3.59
SALES (1000 BU)	24,120	24,080	24,050	24,010	23,970	-0.24	-0.85
GEN WITH HEAT							
YEAR END ACCTS	80,300	84,000	87,700	91,600	95,500	4.51	5.16
AVG ANNUAL ACCTS	78,450	82,150	85,850	89,650	93,550		
AVG ANNUAL USE(BU)	9,290	9,290	9,300	9,300	9,310	0.04	-0.03
SALES (1000 BU)	728,800	763,400	798,100	833,900	870,900	4.61	5.10
SEASONAL							
YEAR END ACCTS	58	58	59	60	61	1.73	1.68
AVG ANNUAL ACCTS	58	58	59	60	61		
AVG ANNUAL USE(BU)	21,720	21,720	21,860	21,830	21,970	0.33	0.02
SALES (1000 BU)	1,260	1,260	1,290	1,310	1,340	2.06	1.81
BC HYDRO USE							
YEAR END ACCTS	93	94	94	96	96	0.85	0.93
AVG ANNUAL ACCTS	93	94	94	96	96		
AVG ANNUAL USE(BU)	12,370	12,340	12,340	12,400	12,400	0.02	0.30
SALES (1000 BU)	1,150	1,160	1,160	1,190	1,190	0.86	1.23
CNG(FIRM)							
YEAR END ACCTS	170	180	190	198	208	5.39	22.37
AVG ANNUAL ACCTS	165	175	186	195	203		
AVG ANNUAL USE(BU)	400,800	407,000	406,100	410,900	418,600	1.24	7.89
SALES (1000 BU)	66,130	71,220	75,530	80,120	84,970	6.72	34.44
TOTAL FIRM							
YEAR END ACCTS	539,876	553,017	566,358	579,999	593,840	2.42	2.72
AVG ANNUAL ACCTS	533,411	546,452	559,694	573,186	586,925		
AVG ANNUAL USE(BU)	2,526	2,555	2,580	2,605	2,632	1.05	1.02
SALES (1000 BU)	1,347,470	1,395,920	1,444,130	1,493,420	1,544,750	3.50	3.80
CNG(INTERRUP.)							
YEAR END ACCTS	10	10	10	12	12	3.71	12.56
AVG ANNUAL ACCTS	10	10	10	12	12		
AVG ANNUAL USE(BU)	686,000	716,000	749,000	650,800	680,800	0.71	8.62
SALES (1000 BU)	6,860	7,160	7,490	7,810	8,170	4.46	22.26
OTHER INTERRUP.							
YEAR END ACCTS	132	134	136	138	141	1.79	1.70
AVG ANNUAL ACCTS	131	133	136	137	140		
AVG ANNUAL USE(BU)	2,142,700	2,147,400	2,135,300	2,156,200	2,146,400	-0.09	0.55
SALES (1000 BU)	280,700	285,600	290,400	295,400	300,500	1.72	2.32
TOTAL INTERRUPT.							
YEAR END ACCTS	142	144	146	150	153	1.94	2.05
AVG ANNUAL ACCTS	141	143	146	149	152		
AVG ANNUAL USE(BU)	2,039,400	2,047,300	2,040,300	2,035,000	2,030,700	-0.17	0.33
SALES (1000 BU)	287,560	292,760	297,890	303,210	308,670	1.78	2.45
TOTAL SALES							
YEAR END ACCTS	540,018	553,161	566,504	580,149	593,993	2.42	2.72
AVG ANNUAL ACCTS	533,552	546,595	559,840	573,335	587,077		
AVG ANNUAL USE(BU)	3,064	3,089	3,112	3,134	3,157	0.76	0.78
SALES (1000 BU)	1,635,030	1,688,680	1,742,020	1,796,630	1,853,420	3.20	3.54

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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GAS
LOW PROJECTION

TABLE 11-17

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR LOW PROJECTION OF ACCOUNTS AND SALES PAGE 1 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 LOWER MAINLAND

	FISCAL 1982/83 ACTUAL	FISCAL 1982/83 NORMAL	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	GROWTH RATE (%)
RES WITHOUT HEAT									
YEAR END ACCTS	9,634	9,634	9,700	9,350	9,000	8,650	8,300	7,950	-3.15
AVG ANNUAL ACCTS	9,808	9,808	9,665	9,525	9,175	8,825	8,475	8,125	
AVG ANNUAL USE(BU)	699	704	719	732	744	756	767	778	1.68
SALES (1000 BU)	6,856	6,900	6,950	6,970	6,830	6,670	6,500	6,320	-1.45
RES WITH HEAT									
YEAR END ACCTS	291,810	291,810	301,200	310,900	320,800	330,000	338,400	347,000	2.93
AVG ANNUAL ACCTS	286,639	286,639	296,500	306,050	315,850	325,400	334,200	342,700	
AVG ANNUAL USE(BU)	1,208	1,264	1,264	1,250	1,226	1,200	1,176	1,152	-1.53
SALES (1000 BU)	346,163	362,320	374,900	382,500	387,100	390,600	392,900	394,900	1.45
GEN WITHOUT HEAT									
YEAR END ACCTS	3,001	3,001	2,785	2,593	2,401	2,259	2,117	2,025	-6.35
AVG ANNUAL ACCTS	3,114	3,114	2,895	2,690	2,495	2,330	2,190	2,070	
AVG ANNUAL USE(BU)	9,710	9,210	10,125	11,240	12,155	12,910	13,505	13,935	7.15
SALES (1000 BU)	30,234	28,680	29,310	30,240	30,330	30,080	29,580	28,850	0.10
GEN WITH HEAT									
YEAR END ACCTS	33,225	33,225	34,300	35,100	36,100	37,500	39,300	41,100	3.61
AVG ANNUAL ACCTS	32,747	32,747	33,760	34,700	35,600	36,800	38,400	40,200	
AVG ANNUAL USE(BU)	9,140	9,360	9,380	9,350	9,240	9,090	8,910	8,820	-0.99
SALES (1000 BU)	299,304	306,440	316,800	324,500	329,100	334,400	342,100	354,600	2.46
SEASONAL									
YEAR END ACCTS	43	43	44	45	46	46	48	48	1.85
AVG ANNUAL ACCTS	42	42	44	45	46	46	48	48	
AVG ANNUAL USE(BU)	23,020	21,900	20,450	19,560	19,130	19,350	19,580	20,000	-1.50
SALES (1000 BU)	967	920	900	880	880	890	940	960	0.71
BC HYDRO USE									
YEAR END ACCTS	79	79	79	81	81	82	83	84	1.03
AVG ANNUAL ACCTS	79	79	80	81	81	82	83	84	
AVG ANNUAL USE(BU)	10,800	11,650	11,750	11,850	11,850	12,070	12,050	12,140	0.69
SALES (1000 BU)	853	920	940	960	960	990	1,000	1,020	1.73
CNG(FIRM)									
YEAR END ACCTS	3	3	3	4	5	5	6	7	15.17
AVG ANNUAL ACCTS	1	2	3	4	5	5	6	7	
AVG ANNUAL USE(BU)	260,000	85,000	66,700	67,500	220,000	526,000	773,300	965,700	49.94
SALES (1000 BU)	260	170	200	270	1,100	2,630	4,640	6,760	84.75
TOTAL FIRM									
YEAR END ACCTS	337,795	337,795	348,111	358,073	368,433	378,542	388,254	398,214	2.78
AVG ANNUAL ACCTS	332,430	332,431	342,947	353,095	363,252	373,488	383,402	393,234	
AVG ANNUAL USE(BU)	2,059	2,125	2,129	2,114	2,082	2,052	2,028	2,018	-0.86
SALES (1000 BU)	684,637	706,350	730,000	746,320	756,300	766,260	777,660	793,410	1.96
CNG(INTERRUP.)									
YEAR END ACCTS		1	1	3	3	3	3	3	20.09
AVG ANNUAL ACCTS		1	1	3	3	3	3	3	
AVG ANNUAL USE(BU)		120,000	800,000	356,700	470,000	496,700	553,300	653,300	32.63
SALES (1000 BU)		120	800	1,070	1,410	1,490	1,660	1,960	59.29
OTHER INTERRUP.									
YEAR END ACCTS	99	99	106	106	106	106	107	107	1.30
AVG ANNUAL ACCTS	97	97	103	106	106	106	107	107	
AVG ANNUAL USE(BU)	2,057,300	1,912,500	1,795,100	1,853,800	1,941,500	1,983,000	2,007,500	2,056,100	1.21
SALES (1000 BU)	199,557	185,510	184,900	196,500	205,800	210,200	214,800	220,000	2.88
TOTAL INTERRUPT.									
YEAR END ACCTS	99	100	107	109	109	109	110	110	1.60
AVG ANNUAL ACCTS	97	98	104	109	109	109	110	110	
AVG ANNUAL USE(BU)	2,057,300	1,894,200	1,785,600	1,812,600	1,901,000	1,942,100	1,967,800	2,017,800	1.06
SALES (1000 BU)	199,557	185,630	185,700	197,570	207,210	211,690	216,460	221,960	3.02
TOTAL SALES									
YEAR END ACCTS	337,894	337,895	348,218	358,182	368,542	378,651	388,364	398,324	2.78
AVG ANNUAL ACCTS	332,527	332,529	343,051	353,204	363,361	373,597	383,512	393,344	
AVG ANNUAL USE(BU)	2,659	2,682	2,669	2,672	2,652	2,618	2,592	2,581	-0.64
SALES (1000 BU)	884,194	891,980	915,700	943,890	963,510	977,950	994,120	1,015,370	2.18

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
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NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR LOW PROJECTION OF ACCOUNTS AND SALES PAGE 2 OF 4

1983 EDITION REVISION# 0 (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)

LOWER MAINLAND

	1989/90	1990/91	1991/92	1992/93	1993/94	AVG. ANNUAL GROWTH 5 YRS(%)	11 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	7,700	7,450	7,200	6,950	6,700	-3.36	-3.25
AVG ANNUAL ACCTS	7,825	7,575	7,325	7,075	6,825		
AVG ANNUAL USE(BU)	785	791	797	804	810	0.81	1.28
SALES (1000 BU)	6,140	5,990	5,840	5,690	5,530	-2.64	-1.99
RES WITH HEAT							
YEAR END ACCTS	355,000	362,600	369,400	376,000	382,700	1.98	2.50
AVG ANNUAL ACCTS	351,000	358,800	366,000	372,700	379,350		
AVG ANNUAL USE(BU)	1,132	1,113	1,101	1,092	1,084	-1.21	-1.39
SALES (1000 BU)	397,200	399,500	402,800	407,100	411,400	0.82	1.16
GEN WITHOUT HEAT							
YEAR END ACCTS	1,930	1,835	1,740	1,645	1,550	-5.21	-5.83
AVG ANNUAL ACCTS	1,980	1,885	1,790	1,695	1,600		
AVG ANNUAL USE(BU)	14,340	14,730	15,135	15,585	16,095	2.92	5.21
SALES (1000 BU)	28,390	27,770	27,090	26,420	25,750	-2.25	-0.97
GEN WITH HEAT							
YEAR END ACCTS	43,100	45,100	47,300	49,500	51,900	4.78	4.14
AVG ANNUAL ACCTS	42,100	44,100	46,200	48,400	50,700		
AVG ANNUAL USE(BU)	8,690	8,580	8,440	8,310	8,170	-1.52	-1.23
SALES (1000 BU)	365,800	378,200	389,900	402,000	414,400	3.17	2.78
SEASONAL							
YEAR END ACCTS	49	50	51	51	53	2.00	1.92
AVG ANNUAL ACCTS	49	50	51	51	53		
AVG ANNUAL USE(BU)	20,200	20,200	20,590	20,590	20,940	0.92	-0.41
SALES (1000 BU)	990	1,010	1,050	1,050	1,110	2.95	1.72
BC HYDRO USE							
YEAR END ACCTS	84	86	86	87	88	0.93	0.99
AVG ANNUAL ACCTS	84	86	86	87	88		
AVG ANNUAL USE(BU)	12,020	12,090	12,210	12,180	12,270	0.21	0.47
SALES (1000 BU)	1,010	1,040	1,050	1,060	1,080	1.15	1.47
CNG(FIRM)							
YEAR END ACCTS	8	8	10	11	12	11.38	13.43
AVG ANNUAL ACCTS	8	8	10	11	12		
AVG ANNUAL USE(BU)	1,086,300	1,210,000	992,000	923,600	865,800	-2.16	23.49
SALES (1000 BU)	8,690	9,680	9,920	10,160	10,390	8.98	45.34
TOTAL FIRM							
YEAR END ACCTS	407,871	417,129	425,787	434,244	443,003	2.15	2.50
AVG ANNUAL ACCTS	403,046	412,504	421,462	430,019	438,628		
AVG ANNUAL USE(BU)	2,005	1,996	1,987	1,985	1,983	-0.35	-0.63
SALES (1000 BU)	808,220	823,190	837,650	853,480	869,660	1.85	1.91
CNG(INTERRUP.)							
YEAR END ACCTS	3	4	4	4	5	10.76	15.76
AVG ANNUAL ACCTS	3	4	4	4	5		
AVG ANNUAL USE(BU)	703,300	555,000	577,500	602,500	506,000	-4.98	13.98
SALES (1000 BU)	2,110	2,220	2,310	2,410	2,530	5.24	31.93
OTHER INTERRUP.							
YEAR END ACCTS	108	109	110	113	114	1.28	1.29
AVG ANNUAL ACCTS	108	109	110	112	114		
AVG ANNUAL USE(BU)	2,065,700	2,075,200	2,085,500	2,076,800	2,068,400	0.12	0.71
SALES (1000 BU)	223,100	226,200	229,400	232,600	235,800	1.40	2.20
TOTAL INTERRUPT.							
YEAR END ACCTS	111	113	114	117	119	1.59	1.59
AVG ANNUAL ACCTS	111	113	114	116	119		
AVG ANNUAL USE(BU)	2,028,900	2,021,400	2,032,500	2,025,900	2,002,800	-0.15	0.51
SALES (1000 BU)	225,210	228,420	231,710	235,010	238,330	1.43	2.30
TOTAL SALES							
YEAR END ACCTS	407,982	417,242	425,901	434,361	443,122	2.15	2.50
AVG ANNUAL ACCTS	403,157	412,617	421,576	430,135	438,747		
AVG ANNUAL USE(BU)	2,563	2,549	2,537	2,531	2,525	-0.44	-0.55
SALES (1000 BU)	1,033,430	1,051,610	1,069,360	1,088,490	1,107,990	1.76	1.99

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

TABLE 11-17

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR LOW PROJECTION OF ACCOUNTS AND SALES PAGE 3 OF 4
(BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL)
1983 EDITION REVISION# 0 LOWER MAINLAND

	1994/95	1995/96	1996/97	1997/98	1998/99	AVG. ANNUAL GROWTH 5 YRS(%)	16 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	6,500	6,300	6,100	5,900	5,700	-3.18	-3.23
AVG ANNUAL ACCTS	6,600	6,400	6,200	6,000	5,800		
AVG ANNUAL USE(BU)	814	819	824	830	833	0.56	1.06
SALES (1000 BU)	5,370	5,240	5,110	4,980	4,830	-2.67	-2.20
RES WITH HEAT							
YEAR END ACCTS	389,500	396,700	404,000	411,400	419,000	1.83	2.29
AVG ANNUAL ACCTS	386,100	393,100	400,350	407,700	415,200		
AVG ANNUAL USE(BU)	1,075	1,066	1,057	1,048	1,039	-0.84	-1.22
SALES (1000 BU)	415,000	418,900	423,100	427,200	431,300	0.95	1.10
GEN WITHOUT HEAT							
YEAR END ACCTS	1,505	1,460	1,415	1,370	1,325	-3.09	-4.98
AVG ANNUAL ACCTS	1,530	1,485	1,440	1,395	1,350		
AVG ANNUAL USE(BU)	16,510	16,850	17,195	17,570	17,970	2.23	4.27
SALES (1000 BU)	25,260	25,020	24,760	24,510	24,260	-1.19	-1.04
GEN WITH HEAT							
YEAR END ACCTS	54,300	56,900	59,500	62,200	65,000	4.60	4.28
AVG ANNUAL ACCTS	53,100	55,600	58,200	60,850	63,600		
AVG ANNUAL USE(BU)	8,050	7,940	7,860	7,790	7,720	-1.13	-1.20
SALES (1000 BU)	427,200	441,600	457,700	474,100	491,200	3.46	2.99
SEASONAL							
YEAR END ACCTS	53	54	55	56	56	1.11	1.66
AVG ANNUAL ACCTS	53	54	55	56	56		
AVG ANNUAL USE(BU)	20,940	21,300	21,270	21,430	21,610	0.63	-0.88
SALES (1000 BU)	1,110	1,150	1,170	1,200	1,210	1.74	1.73
BC HYDRO USE							
YEAR END ACCTS	89	89	91	91	92	0.89	0.96
AVG ANNUAL ACCTS	89	89	91	91	92		
AVG ANNUAL USE(BU)	12,360	12,250	12,310	12,310	12,390	0.19	0.39
SALES (1000 BU)	1,100	1,090	1,120	1,120	1,140	1.09	1.35
CNG(FIRM)							
YEAR END ACCTS	13	14	15	16	16	5.92	11.03
AVG ANNUAL ACCTS	13	14	15	16	16		
AVG ANNUAL USE(BU)	818,500	777,100	743,300	712,500	729,400	-3.37	14.38
SALES (1000 BU)	10,640	10,830	11,150	11,400	11,670	2.35	30.25
TOTAL FIRM							
YEAR END ACCTS	451,960	461,517	471,176	481,033	491,189	2.09	2.37
AVG ANNUAL ACCTS	447,485	456,742	466,351	476,108	486,114		
AVG ANNUAL USE(BU)	1,979	1,979	1,982	1,984	1,986	0.03	-0.42
SALES (1000 BU)	885,680	903,880	924,110	944,510	965,610	2.12	1.97
CNG(INTERRUP.)							
YEAR END ACCTS	5	5	5	5	5	0.00	10.58
AVG ANNUAL ACCTS	5	5	5	5	5		
AVG ANNUAL USE(BU)	528,000	556,000	578,000	606,000	632,000	4.55	10.94
SALES (1000 BU)	2,640	2,780	2,890	3,030	3,160	4.55	22.68
OTHER INTERRUP.							
YEAR END ACCTS	116	117	118	120	122	1.37	1.31
AVG ANNUAL ACCTS	116	117	118	119	122		
AVG ANNUAL USE(BU)	2,057,800	2,065,000	2,072,000	2,079,000	2,053,300	-0.15	0.44
SALES (1000 BU)	238,700	241,600	244,500	247,400	250,500	1.22	1.89
TOTAL INTERRUPT.							
YEAR END ACCTS	121	122	123	125	127	1.31	1.51
AVG ANNUAL ACCTS	121	122	123	124	127		
AVG ANNUAL USE(BU)	1,994,500	2,003,100	2,011,300	2,019,600	1,997,300	-0.05	0.33
SALES (1000 BU)	241,340	244,380	247,390	250,430	253,660	1.25	1.97
TOTAL SALES							
YEAR END ACCTS	452,081	461,639	471,299	481,158	491,316	2.09	2.37
AVG ANNUAL ACCTS	447,606	456,864	466,474	476,232	486,241		
AVG ANNUAL USE(BU)	2,518	2,513	2,511	2,509	2,508	-0.14	-0.42
SALES (1000 BU)	1,127,020	1,148,260	1,171,500	1,194,940	1,219,270	1.93	1.97

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

NATURAL GAS

DETAILED FORECAST 20 FISCAL YEAR LOW PROJECTION OF ACCOUNTS AND SALES (BILLED BASIS, NO ADJUSTMENT FOR ACCRUAL) PAGE 4 OF 4

1983 EDITION REVISIONS 0 LOWER MAINLAND

	1999/00	2000/01	2001/02	2002/03	2003/04	AVG. ANNUAL GROWTH 5 YRS(%)	21 YRS(%)
RES WITHOUT HEAT							
YEAR END ACCTS	5,550	5,400	5,250	5,100	4,950	-2.78	-3.12
AVG ANNUAL ACCTS	5,625	5,475	5,325	5,175	5,025		
AVG ANNUAL USE(BU)	837	840	845	848	852	0.45	0.91
SALES (1000 BU)	4,710	4,600	4,500	4,390	4,280	-2.39	-2.25
RES WITH HEAT							
YEAR END ACCTS	426,600	434,400	442,400	450,500	458,800	1.83	2.18
AVG ANNUAL ACCTS	422,800	430,500	438,400	446,450	454,650		
AVG ANNUAL USE(BU)	1,031	1,024	1,016	1,009	1,001	-0.74	-1.10
SALES (1000 BU)	436,100	440,700	445,500	450,400	455,200	1.08	1.09
GEN WITHOUT HEAT							
YEAR END ACCTS	1,305	1,285	1,265	1,245	1,225	-1.56	-4.18
AVG ANNUAL ACCTS	1,320	1,300	1,280	1,260	1,240		
AVG ANNUAL USE(BU)	18,275	18,525	18,790	19,055	19,330	1.47	3.59
SALES (1000 BU)	24,120	24,080	24,050	24,010	23,970	-0.24	-0.85
GEN WITH HEAT							
YEAR END ACCTS	67,900	70,800	73,700	76,800	79,900	4.21	4.27
AVG ANNUAL ACCTS	66,450	69,350	72,250	75,250	78,350		
AVG ANNUAL USE(BU)	7,660	7,610	7,560	7,500	7,460	-0.68	-1.07
SALES (1000 BU)	509,100	527,500	545,900	564,700	584,400	3.54	3.12
SEASONAL							
YEAR END ACCTS	58	58	59	60	61	1.73	1.68
AVG ANNUAL ACCTS	58	58	59	60	61		
AVG ANNUAL USE(BU)	21,720	21,720	21,860	21,830	21,970	0.33	0.02
SALES (1000 BU)	1,260	1,260	1,290	1,310	1,340	2.06	1.81
BC HYDRO USE							
YEAR END ACCTS	93	94	94	96	96	0.85	0.93
AVG ANNUAL ACCTS	93	94	94	96	96		
AVG ANNUAL USE(BU)	12,370	12,340	12,340	12,400	12,400	0.02	0.30
SALES (1000 BU)	1,150	1,160	1,160	1,190	1,190	0.86	1.23
CNG(FIRM)							
YEAR END ACCTS	18	19	20	21	21	5.59	9.71
AVG ANNUAL ACCTS	18	19	20	21	21		
AVG ANNUAL USE(BU)	663,300	642,600	621,500	601,900	613,300	-3.41	9.87
SALES (1000 BU)	11,940	12,210	12,430	12,640	12,880	1.99	22.88
TOTAL FIRM							
YEAR END ACCTS	501,524	512,056	522,788	533,822	545,053	2.10	2.30
AVG ANNUAL ACCTS	496,364	506,796	517,428	528,312	539,443		
AVG ANNUAL USE(BU)	1,991	1,996	2,000	2,004	2,008	0.22	-0.27
SALES (1000 BU)	988,380	1,011,510	1,034,830	1,058,640	1,083,260	2.33	2.06
CNG(INTERRUP.)							
YEAR END ACCTS	6	6	6	6	6	3.71	8.91
AVG ANNUAL ACCTS	6	6	6	6	6		
AVG ANNUAL USE(BU)	551,700	576,700	593,300	610,000	625,000	-0.22	8.18
SALES (1000 BU)	3,310	3,460	3,560	3,660	3,750	3.48	17.81
OTHER INTERRUP.							
YEAR END ACCTS	123	124	126	127	128	0.96	1.23
AVG ANNUAL ACCTS	123	124	126	127	128		
AVG ANNUAL USE(BU)	2,058,500	2,065,300	2,055,600	2,061,400	2,068,800	0.15	0.37
SALES (1000 BU)	253,200	256,100	259,000	261,800	264,800	1.12	1.71
TOTAL INTERRUPT.							
YEAR END ACCTS	129	130	132	133	134	1.08	1.40
AVG ANNUAL ACCTS	129	130	132	133	134		
AVG ANNUAL USE(BU)	1,988,400	1,996,600	1,989,100	1,995,900	2,004,100	0.07	0.27
SALES (1000 BU)	256,510	259,560	262,560	265,460	268,550	1.15	1.77
TOTAL SALES							
YEAR END ACCTS	501,653	512,186	522,920	533,955	545,187	2.10	2.30
AVG ANNUAL ACCTS	496,493	506,926	517,560	528,445	539,577		
AVG ANNUAL USE(BU)	2,507	2,507	2,507	2,506	2,505	-0.02	-0.32
SALES (1000 BU)	1,244,890	1,271,070	1,297,390	1,324,100	1,351,810	2.09	2.00

NOTES: 1) ACTUAL INT SALES NOT ADJUSTED FOR STRIKES,CURTAILMENT OR WEATHER.
2) NORMAL INT SALES ADJUSTED FOR STRIKES AND TO 30 AV. WINTER DAYS OF CURTAILMENT.
3) FORECAST INT SALES ARE NET OF 30 DAYS CURTAILMENT.
4) COMPOUND GROWTH RATES REFLECT COMPULSORY CONSERVATION.
5) INT. CUSTOMERS WITH I/F RATIOS > OR = 0.95 WERE NOT SWITCHED TO FIRM.
6) FORECAST TO 1993/1994 IS OFFICIAL 11 YEAR FORECAST FOR JULY/83
7) CNG FORECAST PROVIDED BY RESOURCECON.

PART TWELVE

RAILWAY OPERATIONS

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PART TWELVE

RAILWAY OPERATIONS

12.1 Outlook

The railway operations outlook is based on assumed improvements in North American economic conditions. Carload volume for the current fiscal year 1983/84 is estimated at 61 000 cars. The projected carload volume for 1984/85 is 66 000 cars. The increase in volume is based on an increased demand for forest products.

A return to normal traffic volumes is anticipated by 1984/85 and a modest annual growth of a little over 1% is projected for the eight years from 1986/87 to 1993/94 with carload volume in 1993/94 projected to be 82 000 cars. The modest growth is based predominantly on an increase in forest product traffic in the early years of the forecast period and increased foodstuffs, grocery products and appliances in the later years.

Factors which could affect projected volumes are:

- the speed of the economic recovery;
- energy and its impact on all forms of transportation;
- the changes in distribution of goods as a result of the new Annacis Island crossing and Marine Way;
- the V&LI and Roberts Bank agreements;
- land development and the relocation of industry;
- the impact of ALRT on long-term planning; and
- the deregulation of United States rail freight rates.

APPENDIX A

PRICE EFFECTS

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APPENDIX A

PRICE EFFECTS

A.1 Introduction

The load forecast presented in the body of this report is developed based on the economic and population forecasts presented in Part One, the energy prices presented in Part Two and the studies of the major industrial sectors discussed in Part Five. These forecasts and studies are translated into electricity requirements using a "top down/end use" approach to forecasting. The top down aspect of the approach entails the use of the population and economic forecasts and sectoral studies to project the household formation, commercial activity and industrial production that generate the need for electricity. The end use aspect of the approach entails analysis of how various customers presently use electricity and how that use is likely to change in the future.

The end use method of forecasting differs from the econometric approach in that it does not involve the use of equations based on historic relationships between energy use, energy prices and other economic variables to estimate the effects of price changes on load growth. Rather the effects of prices are examined by first establishing the scope customers have for changing electricity use by measures such as installing more efficient appliances, switching to more efficient lighting, or self generating electricity rather than purchasing. Having established the scope for changing electrical use, the responses of customers are estimated based on the energy price forecasts.

The general approaches used to forecast Residential, General and Transmission Rate sales are outlined in Parts Three, Four and Five respectively. This Appendix elaborates on how prices were taken into account in preparing those forecasts and compares the elasticities implicit in the forecasts with the price elasticities that have been estimated by others. The sequence of discussion in this Appendix is:

(i) to describe how energy prices were used in preparing the various components of the load forecast;

(ii) to estimate, where possible, the price elasticities implicit in the forecast; and

(iii) to compare these implicit elasticities with those estimated by others.

Items (i) and (ii) are addressed for the major rate categories in Sections A.2 through A.4. In order to address item (iii) a review of the literature and the results of B. C. specific studies are presented in Section A.5 and A.6 respectively, and the results are compared in Section A.7.

A.2 Residential Sales

The growth in residential sales is a function of the rate of household formation, the proportion of households utilizing electric heat, the levels of insulation in those households and the number of appliances installed and their requirements for electricity. In preparing the residential forecast it is assumed that:

- the rate of household formation and the number of appliances installed are largely a function of population and income and are essentially independent of electricity prices;

- the proportion of households installing electric heat is largely a function of electricity prices relative to the prices of other sources of energy and the types of housing being constructed; and

- the level of insulation, the efficiency of the appliances and the amount they are used are influenced by electricity prices.

The Energy Use Engineering group within B. C. Hydro has prepared a number of studies over the past five years which examine the likely improvements in the efficiencies of appliances and lighting and the likely reductions in electrical requirements for space and water heating as a result of better insulation and other means. These studies thus provide information on the scope for reducing electricity consumption for each type of end use. The likely changes within this scope are estimated taking into account the electricity price forecast. The changes estimated for use in this forecast, as shown in TABLE AA-1, are reductions by 2003/04 of about 20 to 30% for appliances, 40% for lighting, 30% for water heating and about 40% for space heating.

These reductions in electric energy use are attributed, as would be expected, to rising electricity prices in B. C.; rising electricity prices in the rest of Canada and North America, which influence the design of appliances which will be available in B. C.; factors such as regulations and programs by government and other agencies aimed at reducing electricity consumption; and the trend to smaller households and fewer people per household.

The analysis presented here to estimate the elasticities implicit in the forecast focusses first on the total reductions resulting from rising prices generally and other factors, and then on reductions that can be attributed just to rising prices in B. C. To estimate the total reductions in future residential sales a residential forecast is made leaving the unit use rates for new appliances, lighting and water and space heating at the 1982/83 levels (Column (1) in TABLE AA-1) over the forecast period. The resulting forecast is then compared to the residential forecast from Part Three based on the projected 2003/04 unit use levels.

The effect of having no further improvement in unit uses would increase the residential load by 830 GW.h to 12 436 GW.h in 1993/94 and by 2 000 GW.h to 16 649 GW.h in 2003/04.

TABLE AA-1

EFFECT OF PRICE ON
RESIDENTIAL ELECTRIC USE

Appliance	Average Annual Consumption of a New Appliance or Heating in a New Household		
	1982/83 (kW.h) (1)	2003/04 (kW.h) (2)	% Change
1. Water Heater	4 000	2 800	30
2. Range	1 150	900	22
3. Microwave	240	170	29
4. Fridge	1 390	1 080	22
5. Freezer	1 375	900	35
6. Washer	60	50	17
7. Dryer	900	750	17
8. Dishwasher	350	200	43
9. Blockheater	200	150	25
10. Lighting	1 000	600	40
11. Other[a]	950	1 900	-
12. Space Heating	5 900	3 500	40

[a] 'Other' includes televisions, small appliances, water beds, hot tubs, etc.

Estimating the extent to which the improvements result from changing electricity prices in B. C., as opposed to other factors such as changing electricity prices elsewhere, is largely a matter of judgement. However, it is evident that the projected improvements in appliances by the end of the period will be mainly a function of the efficiencies of the appliances available at that time which in turn will be influenced by the average trend in electricity prices in North America. The reduction in use for water heaters on the other hand will be influenced more by electricity prices in B. C.

Of the 830 GW.h total improvement in Residential sales as a result of all factors by 1993/94, 480 GW.h are attributed to higher electricity prices in B. C. and 350 GW.h are attributed to other factors. In 2003/04, 1 270 GW.h of the 2 000 GW.h change are attributed to B. C. prices and 730 GW.h to other factors. This distribution between the effects of B. C. prices and of other factors must be considered very approximate and is included more for illustration purposes than as definitive estimates. More work is planned in this area.

These changes in use, the corresponding changes in electricity prices and the implicit elasticities are summarized in TABLE AA-2.

Ranges of price elasticities in TABLE AA-2 for 1993/94 and 2003/04 are calculated first for B. C. price effects and then for total price effects by attributing all the changes to B. C. price changes. Although 1982/83 is the starting point, residential customers would not have had the opportunity to react fully to the significant price increase in 1981/82, so for the purposes of calculating elasticities, price changes from 1981/82 as well as future price changes are considered.

On this basis the long term elasticity implicit in the forecast with respect to B. C. prices is -0.3 to -0.6 but would be -0.5 to -1.0 if all improvements were attributed to B. C. prices. These ranges represent the own price elasticity for electricity and do not take into account the changes in use resulting from relative price changes of electricity and alternative fuel sources such as gas.

TABLE AA-2

ESTIMATED PRICE EFFECTS
ON RESIDENTIAL FORECAST

		1993/94	2003/04
1.	Estimated Load if No Improvements in Unit Use (GW.h)	12 436	16 649
2.	Reductions Due to:		
	(a) Increase in B. C. Prices (GW.h & (%))	480 (3.9%)	1 270 (7.6%)
	(b) Other Factors (GW.h & (%))	350 (2.8%)	730 (4.4%)
	(c) Total (GW.h & (%))	830 (6.7%)	2 000 (12.0%)
3.	% Increase in B. C. Prices		
	over 1981/82 level	23%	23%
	over 1982/83 level	12%	12%
4.	Elasticity Resulting From B. C. Price Effects (2(a)÷3)	-0.2 to -0.3	-0.3 to -0.6
5.	Elasticity if total change attributed to B. C. prices (2(c)÷3)	-0.3 to -0.6	-0.5 to -1.0

A.3 General

The General category comprises fairly diverse uses of electricity including sales to commercial, institutional and small industrial customers. The approaches to forecasting vary from use to use as does the way in which the effects of prices are incorporated. For the purposes of forecasting the load is divided into five principal categories:

(i) one category (representing 44% of total General sales) for floorspace related loads such as retail trade and education which are forecast by first estimating floorspace requirements, based on forecasts of economic activity and population growth, and then estimating electricity use per unit of floorspace taking into account the projected changes in electricity prices;

(ii) a second category (28%) for loads such as other manufacturing and utilities which are forecast by linking to sectoral or total GDP growth;

(iii) a third catogory (13%) for wood manufacturing which is forecast by linking to a specific industrial study;

(iv) a fourth category (7%) for loads such as common areas in apartments which are forecast based on the relevant portions of the forecast; and

(v) a fifth unclassified category (8%) which is forecast to grow in proportion to the commercial electricity growth.

In effect the first three categories entail the use of three separate methods of forecasting and the last two categories involve the application of certain aspects of these methods to remaining portions of the load.

In the first category explicit assumptions are made with respect to price effects. Forecasts of floorspace and electricity consumption per square meter of floorspace are prepared for retail, food service, office and accommodation activities. The electricity use per unit of floorspace is examined in terms of requirements for lighting, motors and miscellaneous uses such as office equipment. The present use for each of these requirements and the projected future use in existing and new buildings is presented in TABLE AA-3. The use in schools and hospitals was examined in the 1982 load forecast report in which it was concluded that improvements in lighting would be offset by higher use for various types of equipment.

In the second category price effects are handled less explicitly. It is generally assumed that growth in electrical requirements will equal growth in the corresponding economic activity. Work to disaggregate this category and to determine how each subcomponent has grown historically relative to economic growth is still underway. Although disaggregated data are not available, it is known that the growth of the total electric sales in the General category was about 1.5 times GDP from 1966 to 1976 when real electricity prices were declining and 1.2 times GDP from 1976 to 1982 (ignoring the 7% decline in GDP in 1982) when real electricity prices increased by about 12%. In projecting growth at 1.0 times GDP, it is in recognition that further effects of price will take place.

The forecast of electricity requirements for wood manufacturing, the third category listed above, is based on the Woodbridge, Reed study of the forest industry. That study does not explicitly link electric use to prices but it does include an examination of the likely future changes in electricity requirements per unit of production.

TABLE AA-3

COMMERCIAL FLOORSPACE ELECTRICITY USE RATES
kW.h/m² for Old (New) Floorspace

		Use Rates Used in Preparation of 1983 Load Forecast			
Category	Year	Lighting[b]	Motors	Misc	Total
Retail[a]	1982	107	88	-	195
	1985	102(86)	85(84)	-	187(170)
	1995	86(70)	84(82)	-	170(152)
	2005	75(60)	84(80)	-	159(140)
Food Stores[a]	1982	143	385	22	550
	1985	136(114)	373(370)	22	531(506)
	1995	114(93)	370(358)	22	506(473)
	2005	100(79)	366(350)	22	488(451)
Food Services (Restaurants/Cafes)	1982	175	175	150	500
	1985	166(140)	170(168)	150	486(458)
	1995	140(114)	168(163)	150	458(427)
	2005	123(96)	166(159)	150	439(405)
Office	1982	135	98	12	245
	1985	128(108)	95(94)	50(60)	273(262)
	1995	108(88)	94(91)	90(100)	292(279)
	2005	95(74)	93(89)	120(130)	308(293)
Accommodation	1982	38	75	37	150
	1985	36(30)	73(72)	37	146(139)
	1995	30(25)	72(70)	37	139(132)
	2005	27(21)	71(68)	37	135(126)

[a] Retail and Food Stores are combined to represent total retail sales category.

[b] Represents reductions in lighting use of 5% (20%), 20% (35%), 30% (45%) in 1985, 1995 and 2005, respectively.

Only the first of the three categories, excluding schools and hospitals, provides sufficient information to permit a comparative analysis of what would happen with and without price increases as was done for the residential category. As indicated in TABLE AA-3 the improvements seen for this category, which represented 3 524 GW.h of use in 1982/83, result largely from improvements in lighting. The fact that these improvements are forecast to take place reduces this component of the load by 520 GW.h (10%) in 1993/94 and 1 140 GW.h (15%) in 2003/04 relative to what the load would have been without the improvements.

If all the improvements were attributed to B. C. prices the long term elasticity implicit in the forecast would be -0.7 to -1.2. If a portion of the improvements similar to that in the residential category is attributed to other factors, the long term elasticity for B. C. prices is -0.4 to -0.8.

A.4 Transmission Rate Sales

The principal Transmission Rate loads are the pulp and paper industry, the chemical industry serving the pulp and paper industry, metals mining and smelting and coal mining. Each of these are forecast separately.

A.4.1 Pulp and Paper Industry

The forecast for the pulp and paper industry is based on the sector study for the forest industry by Woodbridge, Reed as was the wood manufacturing forecast. This sector study examines the annual allowable cut in the province, the relative advantages for the various pulping processes that would utilize the wood resource and the markets for pulp and paper products to arrive at forecasts of production by product type. These production forecasts are translated first into total requirements for electric energy based on the requirements per ton for each type of pulp and paper process and then into B. C. Hydro sales by projecting, and subtracting from total requirements, self generation of electricity by the mills.

In the face of rising electricity prices, pulp and paper mills may be able to reduce their purchases from B. C. Hydro by either generating more electricity themselves or improving the energy efficiency of their operation. In the case of self-generation, the pulp and paper industry have two advantages over most industries in that:

- certain by-products of their operation are combustible fuels that can be used to fire boilers; and

- their large requirements for low-pressure process steam create an opportunity for cogeneration of electricity which results in a more efficient use of fuel than a typical condensing turbine.

Woodbridge, Reed based their forecast of self generation on trends in other countries. Over the 20 year period they forecast cogeneration to increase by about 900 GW.h between 1986, when existing cogeneration facilities reach full output, and 2003/04. This increase of 900 GW.h is equivalent to about 10% of B. C. Hydro's sales to the total pulp and paper industry in 2003/04 and translates into new cogeneration capacity installations of about 75 MW by 1993/94 and 150 MW by the end of the period.

In the case of electrical use per unit of production, Woodbridge, Reed tended to use existing requirements adjusted for changes in processes and methods of production such as a move to a lower basis weight for newsprint which increases the electrical requirements per ton of product.

B. C. Hydro has reviewed certain aspects of Woodbridge, Reed's work on future trends in cogeneration and unit electricity use. In the case of cogeneration the review is based on the study in the latter part of the 1970's by Intercontinental Engineering Ltd. (Integ) which was commissioned to examine the potential for additional cogeneration in British Columbia. Integ identified 225 MW of potential additional cogeneration in the pulp and paper industry of which 150 MW was either underway at the time of the study or has been undertaken since then. This leaves 75 MW of remaining potential capacity. Although new mills are forecast to be built over the next 20 years, these will be TMP and CTMP mills which, because they utilize a much higher proportion of the fiber than kraft mills and have a very low requirement for process steam, do not provide opportunities for additional cogeneration.

The rate at which this remaining 75 MW of cogeneration is installed will be influenced by:

- the extent to which mills undergo major rebuilds, since in the past cogeneration has often been installed at the time of other major changes;

- the availability of hog fuel; and

- electricity prices.

It has not been possible in this study to develop a quantitative relationship between the economics of cogeneration and electricity prices and the other factors influencing a decision to install more cogeneration. However the estimate of the potential of 75 MW does help define the scope of pulp and paper mills to respond and indicates that Woodbridge Reed may have been overly generous in projecting 75 MW of additional cogeneration by 1993/94 and 150 MW by 2003/04.

The review of possible changes in the unit use of electricity as a result of higher electricity prices is based on B. C. Hydro's 1980 study titled "Electric Motor Potential Impact on Energy Conservation and Energy Needs in B. C.". The study indicated that in the forest, mining and chemical industries electric motors account for over 95% of electrical energy usage with lighting and other uses consuming the remaining 5%. The report also suggested that the introduction of high efficiency motors could result in energy savings of 10-15% for motors in the fractional horsepower range and 1/2-3% for motors over 100 HP.

The report concluded that potential savings in the 2-3% range existed in the pulp and paper industry (Page 13). This result was based on an estimate of the mix of motor sizes being used by industry at the time of the study. More recent discussions with industry representatives suggest that the long term potential of 2-3% is still relevant. However, to date companies have not installed a significant number of high efficiency motors.

Although not studied in detail, the 1980 report does indicate that more efficient application of motors, i.e. variable drives, and more efficient controls could improve efficiency by another 7%. Again there has been no indication of these changes taking place.

Whereas the B. C. Hydro review of Woodbridge, Reed's cogeneration estimates indicated that they might have been too generous the review of the possible reductions in unit use indicates they may not have been generous enough with their estimates of future conservation. However, on balance their forecast of sales by B. C. Hydro seem reasonable for the levels of production forecast.

This review also indicates that the overall scope that the industry has for reducing electricity use in the face of rising prices, and thus the price elasticity, is fairly low.

A.4.2 Chemical Industry

The electric requirements for the chemical industry serving the pulp and paper industry is based on the forecast production rate for the chemical pulping processes. At this point there has not been any detailed assessment of how this use may change with rising electricity prices. Such an assessment is planned for the 1984 load forecast.

A.4.3 Metals Mining and Smelting

The forecasts of the electrical sales to the metal mining and smelting industry are based on a sectoral study similar to that for the forestry industry. Existing and potential mines in the province are analysed, the world market and prices for the various metals are examined and projections of production in the province on a mine-by-mine basis are made.

In 1982, Wright Engineers and H. R. Halvorson Consultants Ltd., who forecast the requirements for this sector, were asked to examine the impact of a 15-20% increase in electricity prices on electricity consumption in the metals mining industry. That paper, reproduced as part of the 1983 sector study, indicates that the electrical use in mining and milling is roughly 65-75% for crushing and grinding, 10-15% for flotation and 5-10% for mining. The balance is for tailing disposal, water supply, shops, heating and ventilation and lighting. In crushing and grinding, flotation and mining the electricity is used to power large electric motors. In one B. C. mine, electricity is used to run a conveyor system to take ore from the pit, but the rest use diesel-powered trucks for this purpose.

Wright and Halvorson note that there is little leeway for reducing electricity consumption, particularly in existing operations, and that although diesel powered shovels and drills could be used, it would require a very substantial increase in electricity prices to justify the capital investment in existing mines. The trend however is to use more electricity, rather than less for conveying ore and waste from the mine.

It was noted that all B. C. mines have examined their electricity costs as a result of rising prices, and taken certain steps, but that little reduction in overall consumption has occurred. These steps to reduce electricity use have included:

- some saving in lighting although this represents a very small percentage of total electricity costs;
- recycling process water to cut down on pumping from the water source; and
- adopting larger flotation cells which result in lower power use.

They conclude that an electricity price increase in the 15-20% range would only result in a minimal reduction in consumption.

A.4.4 Coal Mining

As part of the report "Forecast of Coal Mining Activity to 2002", March 1983, H. N. Halvorson commented on the price sensitivity of electricity consumption (page 80). Halvorson indicates that the scope for coal mining activities to reduce electricity is limited in the same way as metal mining. With essentially all of the forecast electricity load coming from mines which are either now operating or will be operating by the end of 1983, changes to a more or less electric intensive operation which would require additional capital investment are fairly unlikely. As in the case of metals mining, the major opportunity for using either electricity or diesel is for haulage, i.e. trucks versus conveyors or trolleys.

The Halvorson report also addresses the likelihood of mines self-generating their electricity requirements using waste coal. He notes that mines have examined this option, but that there has generally been a reluctance for coal mining companies to get into the power generating business. Some of the reasons for this are:

- the northeast and southeast coal is low volatile and high ash, this would lead to high capital operating costs; and
- a small on-site power plant would have difficulty in coping with the power surges required by large pieces of equipment such as drag lines.

Obviously, there is a certain level of electricity prices which would justify the coal mining companies generating their own power and overcoming the problems outlined above. To determine just what that price increase is would require fairly extensive study for each mine and taking into account such factors as different financing costs between Hydro and private industry, the shorter payback periods for industry, coal quality and the nature of electrical requirements of the various types of equipment.

As in the case of the assessments of the other industries, translating such general observations about the industry into any price elasticity is difficult. However, with the fairly narrow range of price changes being considered, the likelihood of these increases resulting in any significant change in purchased electrical use in B. C. mines is considered to be low.

A.5 Literature Review

In 1981, B. C. Hydro retained National Economic Research Associates, Inc. (NERA) to review economic literature on the price elasticity of electricity demand. As part of its review, NERA specified a range of elasticities which they felt have an 80% probability of including the true value for each of B. C. Hydro's rate categories. NERA estimated the long term elasticities for the residential category to be -0.6 to -1.2; for the commercial category to be -0.4 to -1.0; and for pulp and paper and mining, B. C.'s two major industries, to be -0.70 to -1.60 and -0.40 to -1.00, respectively.

In 1982 a group of intervenors at the British Columbia Utilities Commission (BCUC) Hearings retained J. P. Acton to present evidence on price elasticity. Acton also based his figures on the literature, although he included more Canadian studies than NERA, and like NERA presented a range of elasticities which he felt have an 80% probability of including the true value for B. C. Hydro's customers. Acton's results, as shown in TABLE AA-4, are essentially the same as NERA's for all categories.

The Residential and General/Commercial elasticities estimated by NERA and Acton tend to be fairly similar to those implicit in the end use analysis. However the Transmission/Industrial elasticities are substantially above what the end use studies indicate.

In the course of preparing the 1983 forecast some additional literature has been reviewed to attempt to gain some sense of the reliability and relevance of the results of the econometric analyses cited by NERA and Acton, particularly those for large industries. In addition to the work based on B. C. data presented in the next section, two studies from the U.K. provide some perspective on this question.

These are:

"Report of the Working Group on Energy Elasticities" Energy Paper Number 17, Department of Energy, U.K. 1977; and

"Industrial Electricity Consumption in the U.K., Past Determinants and Possible Futures" by Steve Thomas and Gordon MacKerron in Energy Policy, December 1982.

The first article, which deals with all types of energy, makes the points that:

- changes in energy prices in the pre oil embargo period were generally small and changes in energy use were dominated largely by changes in income; and

- analyses based on pre oil embargo data, of which most of those reviewed by NERA and Acton were, "can play no more than a subordinate role to other considerations in assessing future price responses".

The second article, which deals with total energy and electric energy use by industry, makes the points that:

- energy costs often represent a relatively small portion of total costs which are made up largely of capital and labour costs;

- in making investment decisions the choice and quantity of energy input is determined more by the criterion to minimize total costs; and

- that a very high proportion of industrial electricity consumption is for applications such as stationary motor power, lighting and electro-chemical processes in which electricity either has a very substantial cost advantage over other energy sources or is the only energy that can be used.

The general conclusion of this literature review is that, although there may be a preponderance of literature indicating certain price elasticities based on econometric studies, these elasticities do not necessarily provide an appropriate basis for estimating the effects of price changes on future consumption.

TABLE AA-4

PRICE ELASTICITIES BASED ON LITERATURE REVIEWS

	NERA	Acton
Residential		
Short Term	-0.15 to -0.3	-0.12 to -0.35
Long Term	-0.1 to -1.0	-0.40 to -1.00
General/Commercial		
Short Term	-0.1 to -0.3	-0.10 to -0.35
Long Term	-0.4 to -1.0	-0.40 to -1.00
Transmission/Industrial		
Total	N/A	
Short Term		-0.2 to -0.4
Long Term		-0.7 to -1.3
Pulp & Paper		
Short Term	-0.25 to -0.35	N/A
Long Term	-0.7 to -1.6	
Mining		
Short Term	-0.1 to -0.3	N/A
Long Term	-0.4 to -1.0	

A.6 Econometric Analyses Based on B. C. Data

Whereas the previous section draws on studies throughout North America and the U.K., this section addresses econometric analyses that have been prepared using British Columbia data. Work on the effects of price on electricity sales has been ongoing at the University of British Columbia for some time. One of the more recent UBC studies to provide an elasticity estimate was "The Link Between Electricity Prices and the Need for New Dams in British Columbia" by Helliwell and Margolick and submitted as evidence at the Site C Hearings before the BCUC. In that study the own price elasticity for electricity over a five-year period is estimated to be -.53 for all categories.

In 1982, B. C. Hydro retained Datametrics Ltd. to do preliminary work on total energy forecasting. Since then B. C. Hydro has undertaken some additional in-house econometric work concentrating on electricity and the Ministry of Energy, Mines and Petroleum Resources has published a staff paper "The B. C. Energy Demand Forecasting and Planning Model" which, as well as doing additional work, draws upon the UBC studies.

The Datametrics work developed a series of equations for forecasting electricity, natural gas and oil consumption in B. C. A report "Projections of British Columbia Energy Demand - Residential, Commercial and Industrial Sectors, 1982-2001" was prepared and submitted as evidence at the Site C Hearing. However, in many cases, the formulations given were qualified stating that considerable additional work would be required to arrive at truly useful formulations.

The work by B. C. Hydro has concentrated on developing equations that describe the trends in electricity sales relative to independent variables such as electricity prices, oil prices, gas prices, personal disposable income, GDP and population. In the residential category, the analysis concentrated on two areas:

- the choice of electricity, oil or gas as the fuel for space heating; and

- the trends in consumption per household and total consumption relative to the independent variables.

The analysis of the capture rate for electricity indicated findings similar to those outlined in Part Three of this report. First, no significant statistical relationship could be found between gas prices and electricity prices and the space heating capture rate for electricity and gas, although there was greater success in relating electricity capture rate to the price of oil. Second, the choice of fuel is very much a function of the type of housing, i.e. single, detached, row or apartment, and thus the trend in capture rates for electricity becomes, to a degree, a matter of forecasting the proportions of new housing to each of these groups. Developing a formulation that describes the changes in Residential sales relative to the independent variables requires further work.

In the General category the work is constrained by the aggregation of a wide variety of commercial, institutional and industrial activities into one sales category. Work is underway to disaggregate the historic sales data by Standard Industrial Classification coding back to 1975. Meaningful analysis is not really possible until this disaggregation is complete.

In the Transmission Rate category, some preliminary analysis of total B. C. Hydro sales has been prepared. This, of course, excludes the generation and use by Alcan, Cominco and a large number of the pulp and paper mills which have self-generation. However, this analysis does indicate elasticities for this total sector considerably below the results indicated by NERA and Acton. As in the case of the General category, meaningful analysis can only be carried out using more disaggregated data and taking into account the purchase/ self-generation choice available to a number of industries. B. C. Hydro will be continuing with its work on all three categories over the coming year.

The most complete work to date on econometric modelling and elasticity estimation in B. C. is the staff paper prepared by the Ministry. The Ministry estimates the overall own long term price elasticity for electricity for all categories to be -0.428, a value quite similar to that estimated by Helliwell and Margolick.

Although the Ministry does not provide elasticities on a category by category basis, a fairly comprehensive discussion is given of the modelling techniques employed and the degree of success. In the case of large industrial customers it was found that the factors and choices with respect to the purchase of electric power are often such that it has not been possible to develop statistically significant relationships to describe or forecast electricity sales as a function of price.

A.7 Comparisons and Conclusions

The objectives in preparing this Appendix were to elaborate on how prices were taken into account in preparing the forecast and to compare the elasticities implicit in the forecast with the price elasticities that have been estimated by others.

Based on the approaches taken, as described in Sections A.2 through A.4, the elasticities implicit in the forecasts are estimated at -0.3 to -0.6 for Residential, -0.4 to -0.8 for the portion of General for which sufficient data were available to allow analysis, and generally to be low in the Transmission Rate category.

The range of long term elasticities suggested by NERA and Acton based on a review of literature were as follows:

Residential	-0.6 to -1.5
General/Commercial	-0.4 to -1.0
Transmission/Industrial	-0.7 to -1.30
Pulp and Paper	-0.7 to -1.60
Mining	-0.4 to -1.0

The upper end of the range of elasticities of -0.3 to -0.6 implicit in the Residential forecast overlaps with the range indicated by NERA and Acton and the range of elasticities of -0.4 to -0.8 implicit in the General forecast agrees quite well with the range based on the literature review. Thus, although an end use approach has been used in preparing these two components of the forecast, the elasticities implicit in them are not significantly different from those based on econometric analyses.

Although actual figures have not been calculated it is evident that the elasticities implicit in the Transmission/Industrial forecast are below those found in the literature by NERA and Acton. However, the review of other literature on this subject, the preliminary econometric analysis by B. C. Hydro and, to a degree, the analyses by the Ministry support the general finding of the end-use analysis that industries in B. C. probably have little scope in responding to the electricity price increases being experienced. Further work is required to fully assess the question of price elasticities for industries, and for other customers.

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